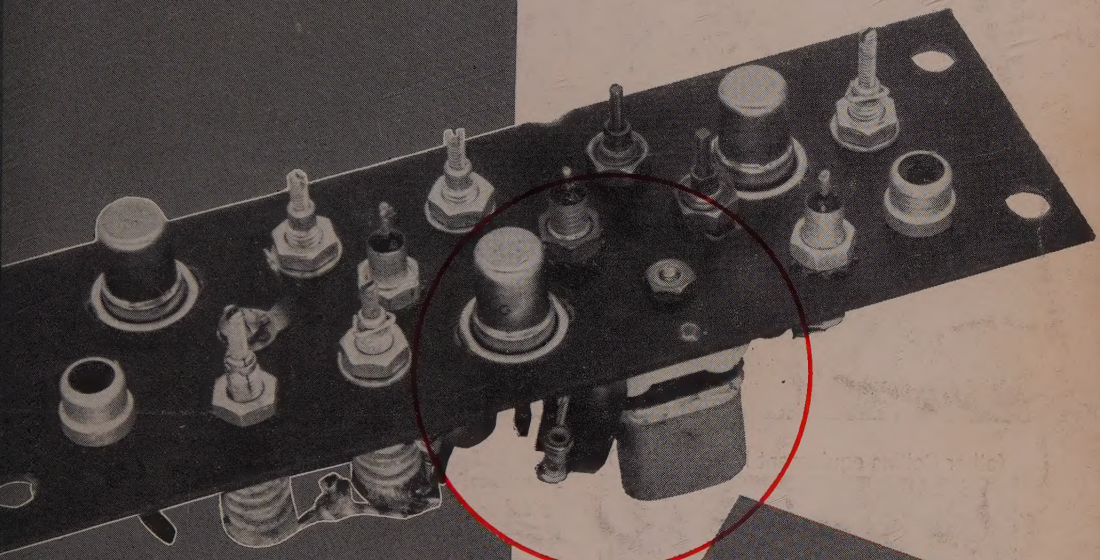
CQ

February 1963
50¢

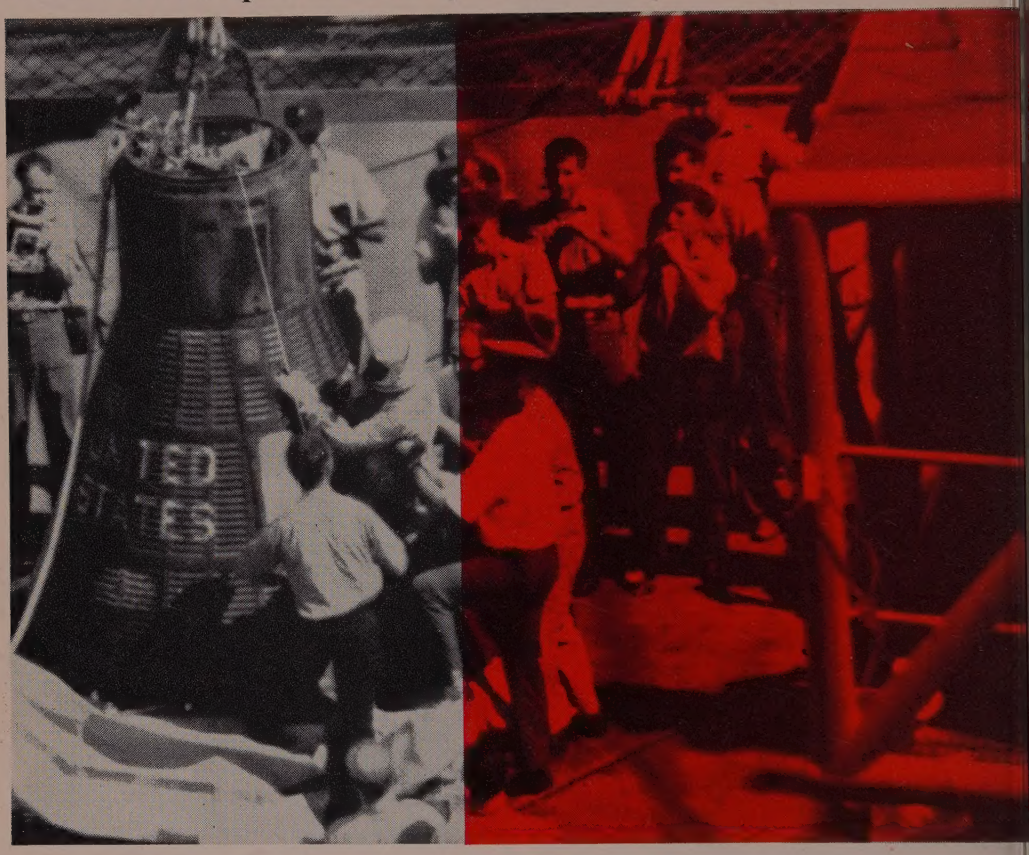
UNIVERSITY OF ILLINOIS
LIBRARY
JAN 31 1963
CHICAGO



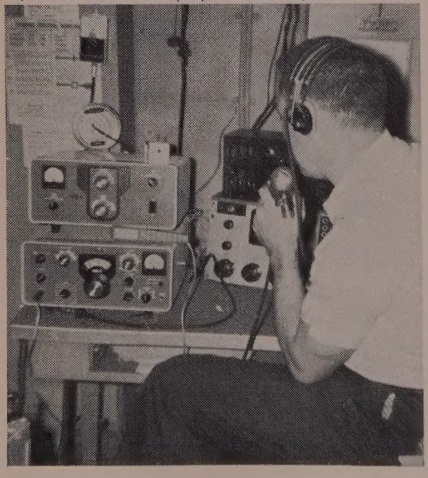
NEW FROM W6AJF...
THE OVERTONE-HARMONIC CRYSTAL OSCILLATOR

The Radio Amateur's Journal

NBC News reports history with Collins amateur gear



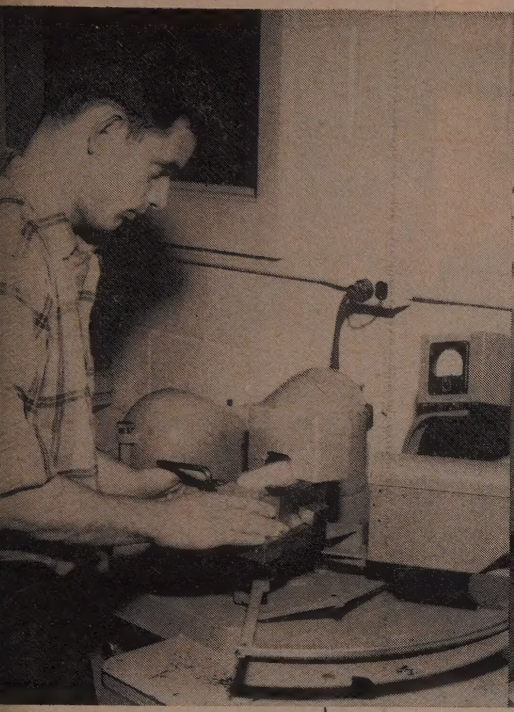
(other Collins equipment helps make it)



Astronaut Walter Schirra stepped from his Mercury spacecr
he did so, an NBC news correspondent aboard the pickup
Kearsarge flashed the historic news directly to a waiting
Recovery reports on all Project Mercury manned flights hav
transmitted instantaneously through Network facilities usin
lins Radio links; KWM-2 Transceivers and 30L-1 Linear A
fiers aboard ship and similar stations in the U.S. (at left) le
directly into NBC transmitters. □ Collins is no stranger to h
events. We've supplied all communication equipment for th
space flights thus far. And the same skill we put into the
and manufacture of sophisticated space communication sy
goes into the design and manufacture of our amateur equip
In fact, many radio innovations in common use today origi
in Collins amateur equipment. This leadership is the reaso
lins has always been able to offer you the finest, most adv
amateur gear available. Let a Collins distributor demonstra
superiority of S/Line equipment today.

COLLINS

X-rays Preorient Raw Quartz for Making PR CRYSTALS...Orientation Verified By X-raying Blanks Coming from Cutter



AMATEUR TYPES

FUNDAMENTAL, PR TYPE Z-2—Frequency Ranges in Kcs.: 3,500 to 4,000 (80-M); 7,000 to 7,425 (40M); 8,000 to 8,222 (2M); 8,334 to 9,000 (6M) ± 500 Cycles . . . $2.95 Net

All Z-2 Crystals calibrated with a pad capacity of 32 mmfd.)

Third Overtone, PR Type Z-9A, 24,000 to 24,666 and 25,000 to 27,000 Kc., ± 3 Kc. . .$3.95 Net

Meters, Fifth Overtone, PR Type -9A, 50 to 54 Mc., ± 15 Kc..... 4.95 Net

itizens Band, PR Type Z-9R 005% .....$2.95 Net

MINIMUM ORDER $10.00

ORDER FROM YOUR JOBBER

Rigid inspections are the rule at every stage of production . . . to make PR Crystals the *finest that money can buy.*

Photograph at left shows raw crystal being pre-oriented. Each bar of crystal must be placed in exactly the right position, as shown by X-ray. The crystal is then locked in place, and the entire jig with crystal is transferred to an automatic cutting machine. Photograph at right shows cut crystals being rechecked by X-ray, to verify precision of orientation.

PR CRYSTALS have been the Standard of Quality since 1934. Get them from your jobber.

PR Crystals

Since 1934

USE PR AND KNOW WHERE YOU ARE

PETERSEN RADIO COMPANY, INC.
COUNCIL BLUFFS, U.S.A.

For further information, check number 1, on page 110

All this performance for only $650.00!

Full amateur band coverage, 80 through 10 meters • Hallicrafters exclusive new R.I.T. (Receiver Incremental Tuning) for ± 2 kc. adjustment of receiver frequency independent of transmitter, and AALC (Amplified Automatic Level Control) • Receiver AF gain and RF gain controls • SSB operation, VOX or PTT . . . CW operation, manual or break-in • 1650 kc. crystal filter . . .

SPECIFICATIONS

Frequency coverage: Eight-band capability — full coverage provided for 80, 40, 20, 15 meters; 10M crystals furnished for operation on 28.5 — 29.0 Mc. Other crystals may be added for full 10 meter coverage without adjustment. Available for operation on specified non-amateur frequencies by special order.

Front panel controls: Tuning; Band Selector; Final Tuning; RF Level; Mic. Gain; Pre-Selector; R.I.T.; Rec. RF Gain; AF Gain; Operation (Off/Standby/MOX/VOX.); Function (CW/USB/LSB); Cal.

General: Dial cal., 5 kc.; 100 kc. crystal cal.; VFO tunes 500 kc.; 18 tubes plus volt. reg., 10 diodes, one varicap. Rugged, lightweight aluminum construction (only 17½ lb.); size—6½" x 15" x 13".

Transmitter Section: (2) 12DQ6B output tubes. Fixed, 50-ohm Pi network. Power input—150W P.E.P. SSB; 125W CW. Carrier and unwanted sideband suppression 50 db.; distortion prod., 30 db. Audio: 400-2800 c.p.s. @ 3 db.

Receiver Section: Sensitivity less than 1 uv for 20 db. signal-to-noise ratio. Audio output 2W; overall gain, 1 μv for ½ W output. 6.0 — 6.5 1st I.F. (tunes with VFO). 1650 kc. 2nd I.F.

Accessories: P-150AC, AC power supply, $99.50. P-150DC, DC power supply, $109.50. MR-150 mounting rack, $39.95.

New

SR·150

Fixed/Mobile Transceiver

hallicrafters

CQ

The Radio Amateur's Journal

Vol. 19, No. 2 February 1963

Editorial Staff

EDITOR
A.S. TROSSMAN, W2DTJ
MANAGING EDITOR
RICHARD A. ROSS, K2MGA
TECHNICAL EDITOR
IRVING TEPPER

CONTRIBUTING EDITORS
CONTEST CALENDAR
FRANK ANZALONE, W1WY
USA-CA CUSTODIAN
CLIF EVANS, K6BX
PROPAGATION
SPACE COMMUNICATIONS
GEORGE JACOBS, W3ASK
RTTY
BYRON KRETZMAN, W2JTP
DX
URB LE JEUNE, W2DEC
YL
LOUISA B. SANDO, W5RZJ
HAM CLINIC
C. J. SCHAUERS, W4VZO/HB9
V.H.F.
DONALD L. STONER, W6TNS
SIDEBAND
DOT STRAUBER, K2MGE
IRVING STRAUBER, K2HEA

BUSINESS STAFF
PUBLISHER
S. R. COWAN
ADVERTISING REPRESENTATIVES
JACK SCHNEIDER, WA2FPE
DICK COWAN, WA2LRO
CIRCULATION MANAGER
HAROLD WEISNER, WA2OBR
PRODUCTION MANAGER
CARY L. COWAN

OFFICES
300 West 43rd Street
New York 36, N. Y.
Telephone, JUDSON 2-4460

CQ—(Title registered U. S. Post Office) is published monthly by Cowan Publishing Corp. Second class postage paid at New York, N. Y. and at Garden City. New York. Subscription Rates: U.S.A. and Possessions, APO, FPO, Canada and Mexico: one year $5.00; two years $9.00; three years $13.00. Pan-American and foreign, one year $6.00; two years $11.00; three years $16.00. Printed in the U.S.A. Entire contents copyright 1963 by Cowan Publishing Corp. CQ does not assume responsibility for unsolicited manuscripts. Postmaster: send Form 3579 to CQ 300 W. 43rd St., N. Y. 36, N. Y.

Table of Contents

The Overtone-Harmonic Crystal Oscillator.....*Frank C. Jones, W6AJF* 28

Automatic RTTY and C.W. With Multi-Gates.....*C. L. Hansen, WØASO* 32

CQ Reviews: The Heathkit HM-10A Tunnel Dipper.....*Wilfred M. Scherer, W2AEF* 36

Reviewing the Radio Classics: Crystal Filters for C.W. Reception.....*David T. Geiser, WA2ANU* 37

A "G-Line" for U.H.F.....*Frederick W. Brown, W6HPH* 38

St. Pierre or Bust, Part II (Conclusion).....*Hal Smith, W2GKE/FP8BM* 40

Taming the Diode Field Strength Meter.....*Rufus P. Turner, K6AI* 44

V.H.F. Transistor Bargains....*Donald L. Stoner, W6TNS* 45

A New Approach to the ZL Special.....*E. M. Wagner, G3BID* 46

A Transistorized D.C. Voltmeter..*Don Rowland, K5DVI* 47

The V.H.F. Amateur..... 69

The Amazing Skeleton Slot.....*Bob Brown, K2ZSQ* 70

The V.H.F. Amateur Twelve Hour V.H.F. Contest.... 71

The Care and Feeding of TV Rotators.....*Michael A. Karr, III, W3JJY* 73

A New Linear (e.c.i.).....*Tom Kneitel, WB2AAI* 74

Getting Along with the Indians .....*David L. Heller, K3HNP* 75

Departments

Announcements	16	QSL Contest	18
Contest Calendar	88	RTTY	58
DX	48	Sideband	56
Ham Clinic	55	Space Communications	54
Ham Shop	102	USA-CA	62
Letters	8	VHF	66
Novice	60	YL	68
Propagation	52	Zero Bias	7

THERE IS GOOD REASON WHY Mosley IS THE WORLDS FAVORITE!

Have you ever tuned the amateur bands and observed how many *Mosley Antennas* are in use today the world over? Have you ever noticed the outstanding signals that come from these *Mosley Antennas*?

When you choose *Mosley*, you choose the best because *Mosley Engineers* are hams and know what it takes to give the best performance. *Mosley* designs quality into each *Antenna So That Each Part Fits*. All holes line up and all tubes are machined and polished completely so that no burrs or rough edges remain. Only 6061-T6 heat-treated drawn tubes are used. This provides the strength needed during maximum wind and icy conditions. All parts are coded so that the *Antenna* can be installed with ease and without the use of a "yardstick". All you need is a screwdriver and pliers.

When *Mosley* says that an *Antenna* is rustproof, we really mean it, because all parts are made of materials that are truly rustproof. Hardware is made of stainless steel so that it is never necessary to treat it to rust-proof it. *Mosley* does more than guarantee its *Antennas* for a given warranty period. If for any reason during the life of the *Antenna* it becomes necessary to replace parts, these parts will only cost the material charge plus a slight handling charge. *Mosley* wants you to enjoy your hobby with the least maintenance costs.

When you buy a *Mosley Antenna*, you can be sure that the *Antenna* has been proven in service. For example - - the traps of the *Mosley Trapmaster TA-33 Junior* or *Senior* are produced under original design. They were designed for a given power rating and they are taking that rating today. You can be sure that either the *TA-33 Junior* or *Senior Mosley Trapmaster* will give you top performance because *Mosley* guarantees by test that each trap is identical to a permanent standard.

Mosley makes available to all hams special technical or engineering information. Won't you write to us today and tell us your problems? You will be pleased with the prompt service you receive.

Mosley
Electronics Inc.
Carl, WØFQY/KØAX
4610 North Lindbergh Blvd.
Bridgeton, Missouri

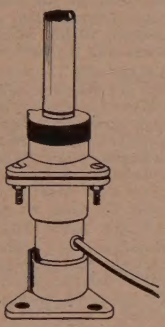
For further information, check number 3. on page 110

IF YOUR CHOICE IS A VERTICAL

Mosley will help you choose an antenna to fit your personal needs.

V-4-8 EQUIVALENT TO SEPARATE 1/4 WAVE-LENGTH VERTICALS!

For 40 and 80 meters, this heavy duty 100% rust proof antenna easily handles 1 KW (AM). The V 4-8 comes complete with cycolac base mount, polyethylene guy rope and hardware. Amateur Net, $85.00.



Base for V-4-8 and V-5

V-5 MEETS HIGH AIR FORCE REQUIREMENTS!

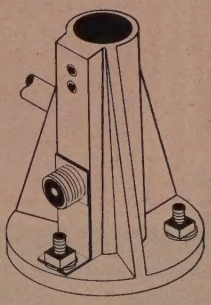
Work 10, 15, 20, 40, and 80 with one antenna... one RG/8U feedline. The V-5 is 100% rust proof and performs brilliantly on each of 5 bands. Handles power of 1 KW to the antenna. Supplied complete with polyethylene guy rope, heavy duty base with internal coax fitting and all necessary hardware.

Amateur Net, $118.50.

V-4-6 HIGH IN PERFORMANCE, LOW IN PRICE!

No bandswitching is necessary on this excellent DX antenna. Exclusive design provides low SWR with response exceptionally flat across full width of each band. Weather proof traps ...easy to assemble... the most popular vertical ever built for 10, 15, 20 and 40 meter operation.

Amateur Net, $27.95.



Base for V-4-6

Mosley Electronics Inc.

Mosley Electronics Inc.
4610 N. Lindbergh Blvd. Bridgeton, Mo.

Please send me detailed specifications, performance ratings and the name of my nearest distributor of the following Mosley antennas.

☐ Model V-4-6 ☐ Model V-4-8
☐ Model V-5

Name.....

Address.....

City.....Zone.....State.....

CQ-2-63

For further information, check number 4, on page 110

WRL

Presents...

A HISTORY MAKING

BREAKTHROUGH!

High Power — Low Cost

Galaxy 300

80-40-20 METERS

SSB TRANSCEIVER

WRL WORLD RADIO LABORATORIES

3415 West Broadway • Council Bluffs, Iowa • Phone: 328-1851

SSB—AM TRANSCEIVER

(Mobile — Fixed)

SELECTABLE SIDEBAND

300 WATTS

ONLY $299.95 WIRED

GALAXY 300 — MOST COMPACT 300 WATT selectable sideband transceiver available. SSB — AM, fixed or mobile (mobile mount to be available).

GALAXY 300 — POWER is rated at an input of 300 watts SSB (PEP), and 75 watts AM — output of 200 watts SSB (PEP), and 50 watts AM. External power required is 800 VDC @ 250 Ma., negative 120 VDC @ 10 Ma., and 12.6 VDC/AC @ 8 A . . . full power. (Matching AC Power Supply and Speaker . . . $79.95 wired.)

GALAXY 300 — RECEIVING sensitivity of 1 microvolt on all bands, product detector, selectable sideband, separate AF and RF gain controls, audio derived "S" meter and AVC action.

GALAXY 300 — TRANSMITS selectable sideband, or AM with inserted carrier, includes PTT operation (or VOX with accessory unit), carrier suppression 50 DB, unwanted sideband suppression 40 DB, adjustable Pi-network for 52 Ohms with 2:1 SWR range, Hi-Z mike input.

GALAXY 300 — EXCLUSIVE TUBE FEATURES. Use of compactron tubes makes the Galaxy 300 the most compact package available in the high power field. Researched and designed by General Electric. 19 tube functions, plus two regulator tubes. Handsome — rugged, cast aluminum panel — iridite treated. Perforated steel case with hinged lid — 7" high, 14" wide, 13" deep, wt. approx. 19 lbs.

GALAXY 300 — FULL PANEL CONTROL of functions, main tuning (200 Kc. each band), tune-operate, audio gain, RF gain, mike gain, carrier balance, driver tune, sideband selector, PA tune, PA load, bandswitch, calibration adjust.

GALAXY 300—EXTRAS, such as crystal lattice filter with 2.7 Kc. bandpass @ 6DB point, and 3:1 shape factor, illuminated meter and dial, adjustable calibration hairline, dual speed tuning (72:1 slow, 12:1 fast) with dual planetary and anti-backlash gear system, internal socket for plug-in VOX-QT unit (to be available as an accessory). Approximately $14.95.

WRL WORLD RADIO LABORATORIES

3415 West Broadway, Council Bluffs, Iowa

- ☐ Enter my order for a "GALAXY 300"
- ☐ Payment enclosed
- ☐ Charge to my account
- ☐ Send detailed specs on Galaxy 300
- ☐ Send Charg-A-Plan information.

Name_____ Call_____

Address_____

City_____ State_____

For further information, check number 27, on page 110

ZERO BIAS

NORMALLY, *CQ* devotes this page to items of interest to amateur radio. Because many amateurs also hold Class-D Citizens Band licenses and others have more than a passing interest in the Citizens Radio Service we would like to discuss some of the factors involved in the FCC's proposed changes in Part 19.

Requirements for obtaining a Class-D citizens radio license are extremely simple. The applicant, of course, must be a citizen of the United States who has reached his eighteenth birthday, and he must be able to read the English language. To prove the last point he must verify to the FCC that he has read in full Part 19 of the Citizens Radio Service.

Part 19 is to the citizens bander as Part 12 is to the amateur; that is, the block of rules by which the licensee must conform to provide minimum interference and proper operations of his station.

It has become obvious, in the last few years, both to the FCC and interested amateurs, that many Class-D licensees have not bothered to read the "fine print" of Part 19, or, if they have, they are openly ignoring the regulations. In either case, the FCC has potently indicated that: ". . . . there has been no intention to permit the operation of [Citizens] radio solely for the amusement of the operator or as a hobby in and of itself."

Docket 14843, which encompasses the recent amendments to Part 19, comes late but comes well received. It is a lengthy amendment, obviously prepared with great skill, using carefully chosen words. It plugs a great many of the loopholes found in the original section which many of the "hobbyists" will find unattractive. It makes clear to the Class-D licensee, in no uncertain terms—if you wish to hobby, get your amateur license.

At this writing, Docket 14843 has received a forty-five day extension from its original January 15th comment deadline. It should be clear to many amateurs that the manufacturers catering to the hobbyist and those who indulge in the citizens radio industrial market may not see eye-to-eye on the proposed changes. They should be consoled, however, since thousands of Class-D licensees will undoubtedly join the ranks of the amateur and their purchasing will probably double.

The changes in Part 19 were inevitable. One cannot imagine the chaos on eleven continuing at such a rapid pace. The lengths at which some licensees have gone to skirt the legality of operations is astounding.

The problem now arises as to the ability of the Commission to enforce these changes. It certainly has been a difficult chore for them in the past and we frankly don't see how they expect to supervise operations in the future.

Amateurs are cautioned that SEC. 605 of the Communications Act of 1934 as amended, prohibits the divulgence of transmissions made in the Citizens Radio Service, or for that matter, any service other than amateur, commercial broadcast or international distress frequencies. So if you feel so inclined to lend a helping hand by reporting violators to the Commission, forget it!

The twenty-three page Docket is far too long to reproduce here but a number of items worth mentioning are that channels 12, 13, 14, 15 and 23 will be used only for communications with *different* stations; 150 miles has been specifically designated as the maximum operating distance over which communications can be carried on; except for emergencies, minor tests, and directing vehicles or vessels for lodgings or directions, communications will be directed to *specific* stations. This would seem to indicate that calling "CQ" is out! The Commission, too, has finally spelled out, quite clearly, who one may or may not communicate with and many more regulations too, are reworded to clarify their meaning.

Docket 14843 is a prime example of what could happen should amateur frequencies become as unruly as eleven is now.

There certainly is a moral to this story and we hope you get the point.

Designed for

Application

The No. 90672
ANTENNA BRIDGE

The Millen 90672 Antenna Bridge is an accurate and sensitive bridge for measuring impedances in the range of 5 to 500 ohms at radio frequencies up to 200 mc. It is entirely different in basic design from previous devices offered for this type service inasmuch as it employs no variable resistors of any sort. The variable element is an especially designed differential variable capacitor capable of high accuracy and permanency of calibration over a wide range of frequencies. A grid dip meter such as the Millen 90651 may be used as the source of RF signal. The bridge may be used to measure antenna radiation resistance, antenna resonance, transmission line impedance, standing wave ratio, receiver input impedance and many other radio frequency impedances. By means of the antenna bridge, an antenna matching unit may be adjusted so as to provide the minimum standing wave ratio on the radiation system at all frequencies.

JAMES MILLEN MFG. CO., INC.

MAIN OFFICE AND FACTORY

MALDEN

MASSACHUSETTS

MORE Techs on Ten

Editor, *CQ*:

In the year that I have been an amateur this is th first time that I have ever written to comment on a editorial appearing in a magazine devoted entirely t amateur radio. However, I feel that I should take th time to praise you for your outstanding journal. I hav enjoyed *CQ* for several years and realize a good magazin when I see one.

Nevertheless, I feel that I must state my opinion o your Nov. editorial in ZERO BIAS. Being a Technician after expiration of a Novice license, it might be though that I would support the Technicians on 10. However this is not necessarily true. My stand is that of neutrality I can see advantages and disadvantages for both sides

CQ is a publication for all amateurs including Tech nicians. Therefore it would seem to me entirely unfai to take a side on the issue of giving ten meters to them I felt that in ZERO BIAS (Nov.) you were extremel prejudiced in your opinions and that to please the major ity of subscribers, the Generals, you threw out all opin ions of the Technicians.

Consider, if you will, the letter in the Nov. issue writte by K8RSC, (82). This man was not thinking of himsel but of the rest of the Technicians. Has anyone considere age a reason for giving Technicians ten meters? Ther are many reasons for and against and I think we shoul all consider these before making up our minds.

S. Sauer, WA9ASZ
6102 Grandview Dr.
Indianapolis, Ind.

Editor, *CQ*:

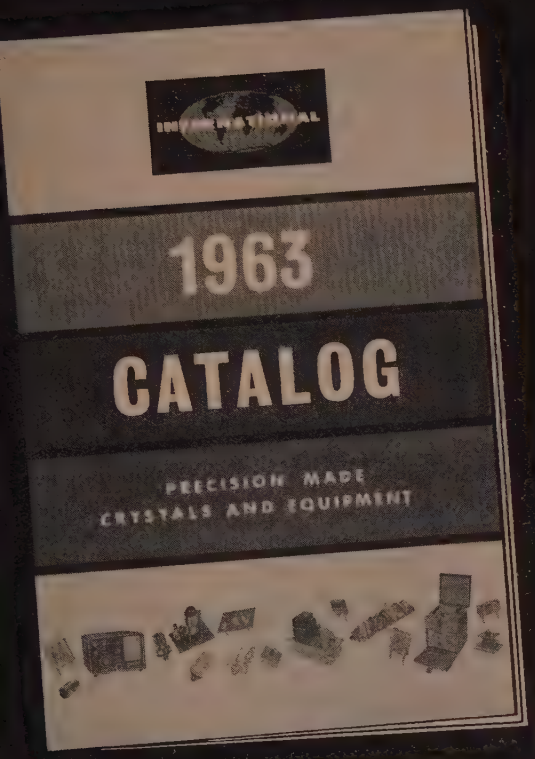
I would like to reply to a letter written to you fro Mr. Jim Young and published in your November issu Maybe you or someone will be interested in an "ou sider's" opinion of the matter of allowing the Technicia on 10 meters. I hope the fact that I am a CBer will n deny me the right to express my opinion, but after rea ing Mr. Young's letter, I am not so sure.

First of all, let me explain that I am a lover of amate radio. I am one of those people who cannot seem t copy the code as required for the General Class Licens It has been my goal in life for several years to obtain th license, but the code requirement has stopped me. Th has not, however, decreased my high opinion of the luck ones, and I do not advocate doing away with the co requirement just so I can obtain a ticket. I intend to g right on trying and maybe some day I will make it.

The main reason for this letter is not to tell my ta

◀ For further information, check number 28, on page 1

FREE 1963 INTERNATIONAL CATALOG



. . . your buying guide for precision radio crystals and quality electronic equipment . . .

- Transmitters
- Amateur Crystals
- Citizens Band Crystals
- Citizens Band Transceivers
- Converters
- Transistor Subassemblies
- Converters
- Power Supplies
- Antennas
- Oscillators

AMATEURS • EXPERIMENTERS • CITIZENS LICENSEES

Mail coupon today for your FREE copy of International's 1963 catalog.

INTERNATIONAL
CRYSTAL MFG. CO., INC.
18 NORTH LEE • OKLAHOMA CITY, OKLAHOMA

International Crystal Mfg. Co., Inc. cq
18 North Lee, Oklahoma City, Okla.
Rush FREE 1963 Catalog.

Name_____
Please Print

Address_____

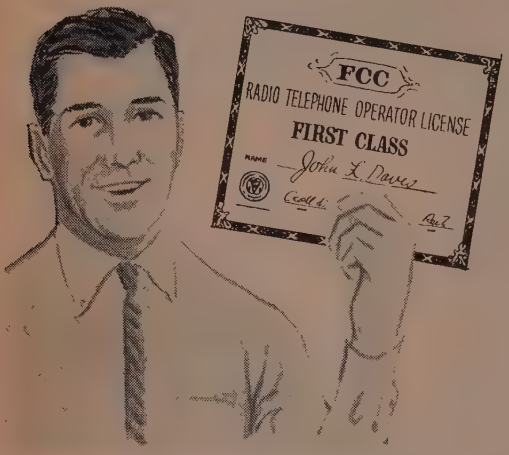
City_____ Zone___ State_____

For further information, check number 5, on page 110

Only Cleveland Institute offers...

A First Class FCC License

...or Your Money Back!



Your key to future success in electronics is a First-Class FCC License. It will permit you to operate and maintain transmitting equipment used in aviation, broadcasting, marine, microwave, mobile communications, or Citizens-Band. Cleveland Institute home study is the ideal way to get your FCC License. Here's why:

Our training programs will *quickly* prepare you for a First-Class Commercial Radio Telephone License with a Radar Endorsement. Should you fail to pass the FCC examination after completing your course, you will get a *full refund* of all tuition payments. You get an FCC License . . . or your money back!

You owe it to yourself, your family, your future to get the complete details on our "proven effective" Cleveland Institute home study. Just send the coupon below TODAY. There's no obligation.

MAIL COUPON TODAY FOR FREE CATALOG

Cleveland Institute of Electronics

1776 E. 17th St., Dept. CQ-97
Cleveland 14, Ohio

How to Succeed in Electronics

Please send FREE Career Information prepared to help me get ahead in Electronics, without further obligation.

CHECK AREA OF MOST INTEREST –

- ☐ Electronics Technology
- ☐ Industrial Electronics
- ☐ Broadcast Engineering
- ☐ First-Class FCC License
- ☐ Electronic Communications
- ☐ _____ other

Your present occupation_____

Name_____ Age____
(please print)

Address_____

City_____ Zone____ State_____

Accredited Member National Home Study Council

of woe, but to express my disappointment in the glorious order of the brass pounder. It is not a compliment to any organization to have one of it's members express in public an opinion that is 180° out of phase with the accepted ideas of that organization.

The only thing I acquired from Mr. Young's letter is that he wants to run the show as he sees fit, and that he can copy 35 w.p.m. I am sure that I am not the only person who feels this way after reading his letter.

I am for anything that will improve anything. If sharing ten meters will improve anyone's enjoyment of the radio spectrum, then go along with it. Maybe the FCC should set up a special band for Amateurs who feel that they are better than their fellow members.

If I ever pass the code test, I will be just as much a General class license holder as Mr. Young, just as the Technician is as much an amateur.

Bill Newman
881 Lakewood Dr.
La Grange, Georgia

Editor, *CQ*:

Congratulations on your ZERO BIAS in November *CQ*.

Edward F. Erickson, W2CVW
13 Robert Circle.
South Amboy, N. J.

Editor, *CQ*:

It was a pleasure to read your November ZERO BIAS.

Without going into details, would like to inform you that I am in complete agreement with your views, especially the last two paragraphs. We *must* retain our code requirement. (It separates the men from the boys).

As an old subscriber would like to compliment you and your staff for the continued improvements I have noted in your Journal, especially DX, PROPAGATION & HAM CLINIC.

Clair "Ed" Mowry, Sr., K8AEB
714 Diana Street
Ludington, Michigan

Editor, *CQ*:

I can't seem to understand all the fuss over having technicians on ten meters. As everyone who has ever tuned ten will verify, there ain't never nobody there! With 1.2 megacycles of spectrum available, I can't foresee any problems arising when a few thousand techs thunder down on a practically empty band. It'll give them a thrill, increase equipment sales and give the old fogies down on twenty something to beef about between gripes.

I like the new look of your magazine. It was rather disconcerting at first, but after I "psyched" it out, I rather enjoyed it.

Harry Goeller, K4CBO/9
1245 Gable Courts
West Lafayette, Indiana

Editor, *CQ*:

Congratulations on your to-the-point editorial in the November issue!

In noting the letters from those advocating operation on ten it would seem that one point was consistently overlooked. A touching concern was shown about the sparse use of the upper kilocycles of the 29 mc band; but, for some strange reason, not a word was written about the utter lack of stations on the top three megacycles of the 50 mc band or about the dead, dead silence on the entire five megacycles on 220. Could it be (oh, horrors for such a thought), that they were more concerned with getting more frequencies upon which they could operate without having to take an examination honestly administered?

Carl C. Drumeller, W5EHC
5824 N. W. 58th Street
Oklahoma City 22, Okla.

FIRST and ONLY.. remotely tuned ROTATABLE DIPOLE!

DESIGNED SPECIALLY FOR 40 AND 75 METERS IN LIMITED ANTENNA SPACE

NEW-TRONICS CLIFF-DWELLER™

Housing for motors and gear trains with mounting yoke

Resonance and band switching control

ELECTRICAL FEATURES

- Antenna resonance finger tip controlled from transmitter location in shack.
- VSWR: 1.1 to 1 or less across entire band
- Feed-point variable to compensate for antenna environment
- No traps . . . no baluns . . . no matching devices of any kind
- Feed direct with any length 52 ohm cable
- Power handling capacity — maximum legal limit

The CLIFF-DWELLER is another New-Tronics first. Here's a tuneable dipole ideal for hams who live in apartments or in homes on small lots. The CLIFF DWELLER will give you unbelievable performance even in limited space.

MECHANICAL FEATURES

- Approx. lengths
  - 28′-6″ — 26′ 7.0-7.3 mc
  - 30′-6″ — 26′ 3.5-4.0 mc
  - 31′-4″ — 26′ Two-Bander
- Self supporting, accepts 1¼″ threaded pipe for mounting in standard rotators
- Maximum turning radius approx. 15′-8″
- Sturdy aluminum die cast housing for motors and gear trains which drive end sections of dipole
- Heat treated aircraft type, 1¼″ heavy wall aluminum tubing
- Completely waterproofed resonators and housings

MODEL NO.	FREQ. MC	WEIGHT	NET PRICE
CD 40	7.0-7.3	Under 20 lbs.	$ 92.50
CD 75	3.5-4.0	Under 20 lbs.	99.50
CD 40-75	Two Bander	Under 20 lbs.	129.50

See the CLIFF-DWELLER and other fine NEW-TRONICS products at your distributor or write us for descriptive literature.

NEW-TRONICS CORPORATION

3455 VEGA AVENUE • CLEVELAND 13, OHIO

For further information, check number 6, on page 110

TURNER

MICROPHONES . . . BEST FOR MOBILE AND BASE

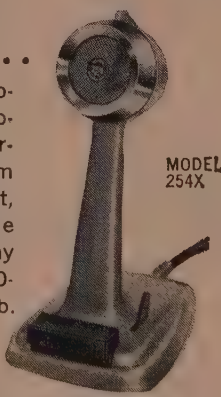
GOING . . .

Convenient, top-performing, low-priced Model 350C from Turner. Rugged, dependable mobile mike . . . world's most popular. Why pay more . . . only $16.80 list . . . buy the Turner 350C. Response: 80-7000 cps. Level: —54 db.

MODEL 350C

OR SITTING STILL . . .

A low-cost crystal microphone with on-off push-to-talk and lock switch. A perfect mike for the ham shack. Cable is 7 foot, three conductor (one shielded), wired for relay operation. Response: 80-7000 cps. Level: —48 db. List price $23.50.



MODEL 254X

SEE YOUR DEALER OR WRITE FOR COMPLETE SPECIFICATIONS

THE TURNER MICROPHONE COMPANY
925 17th Street N.E.,
Cedar Rapids, Iowa

IN CANADA:
Tri-Tel Associates, Ltd.,
81 Sheppard Avenue West,
Willowdale, Ontario

For further information, check number 29, on page 110

Editor, *CQ*:

The continuing lament from some would-be hams that want the code requirement dropped from the FCC exams is getting boring to read. There is no legitimate reason for any one not being able to learn the code, other than there is not a genuine desire to learn it, or else the method he is using is wrong.

It is not for me to say how a person goes about learning the code, because what might be a good method for one person might not be for the next, but if it cannot be learned by one method, then another should be tried until it is mastered.

They cannot sell me on the idea that a handicap would prevent one learning the code. Some years ago one of the ham publications told the story of a fellow who had no use of arms, using a pencil held in his teeth and tapped out the code this way. He had determination, and that is what these fellows that want everything the easy way seem to lack.

As for giving away the 10 meter band to the Techs I agree with those who say NO. The overwhelming number of hams who got their privileges according to the rules proves beyond any arguments this new group can muster, that it can be done.

C. E. Hoover, WØKWY
Ames, Iowa

Editor, *CQ*:

Since everyone is getting in their "two-cents' worth," let me add mine on the current "Technicians-on-Ten" controversy.

First, it has been my observation that under present-day licensing procedures, it has become standard practice for a person applying for the Novice-class license to fill out another form and apply for the Technician-class license at the same time. This, it is explained, is a good means of retaining call letters if for some reason the Novice doesn't quite get around to making General class during the following year. In many cases, the Novice doesn't make General.

It would seem that perhaps some investigation might be made to find just what these Technician licensees have been doing during the past year. Have they been working on the v.h.f. bands? Have they shown interest in investigation of the u.h.f. spectrum? Have they made any attempt at increasing state-of-the-art knowledge at these frequencies? My guess is that in the case of many of these Technicians asking for 10-meter privileges, you would find a Novice station with an expired license.

On the matter of code requirements, my understanding is that the FCC has no choice but to require a code test for an amateur license. This is required under international agreements to which the U. S. is a signatory nation. While it is granted that most military and commercial traffic today is handled by radio-teletype, single-sideband or other means, the fact remains that in many countries c.w. remains the only effective means of long-haul communication. Learning code is not too hard—I waited eight years, during which time I also complained about the need for getting the 13 w.p.m. for a license. Finally, one of my good amateur friends said, "Why don't you simply get busy with it and get the job done?" This was a new thought. I borrowed a set of code-practice records and two months later went down and took my amateur test. No one argues the merits of c.w. versus RTTY or s.s.b. as a means of moving traffic. However, it does serve one other useful purpose—it keeps the amateur bands from sounding the way the Class-D Citizens Band does today.

Allen Auten, WØECN
1254 Clayton St.
Denver 6, Colo.

Editor, *CQ*:

I read with interest the letters under "Techs on Ten," noting the criticisms of c.w. as a requirement for licensing. These criticisms seemed emotional rather than objective.

In all instances the good c.w. operator is superior in electronic know-how and courtesy. Mastering the code

NOW HEAR THIS!

HAMMARLUND'S HQ-180 XE

GOES WORLD WIDE

Take the world reknowned Hammarlund HQ-180; add 115/230V., 50/60 cycle AC mains flexibility **PLUS** 11 crystal controlled channels, and you have the **one** unit suitable for the radio amateur interested in superb SSB reception and RTTY, MARS, C.A.P. and CD. Additionally, as a result of the unusual power supply, the HQ-180XE provides excellent service in commercial and industrial laboratories.

The "Universal" triple conversion HQ-180XE communications receiver features 11 crystal controlled fixed frequency positions in addition to the VFO. Six of the crystals may be plugged in on the face of the unit, the balance easily accessible through the trap door design of the cabinet. The five in-cabinet crystals may be used for the more static channels (e.g. WWV, MARS, C.A.P., and CD net frequencies) the six front panel crystals may then be employed for quick-change frequencies—thus providing virtually unlimited crystal controlled reception.

± **3KC TUNING CONTROL**—Peak reception is assured on all crystal positions by a ± 3KC vernier tuning control located on the front panel.

Complete technical information will gladly be furnished on request.

$499.50 less CRYSTALS

AMATEUR RADIO EQUIPMENT

COMMERICAL COMMUNICATIONS EQUIPMENT

INTERCOM 2-WAY RADIO

VARIABLE AIR CAPACITORS

SUPERVISORY REMOTE CONTROL SYSTEMS

HAMMARLUND Manufacturing Company
A Giannini Scientific Company
53 West 23rd Street, N. Y. 10, N. Y.

NAME_____

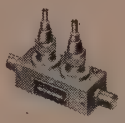
ADDRESS_____

Join us at the Single Sideband Amateur Radio Association Hamfest and Dinner. Statler Hilton Hotel, New York City, March 26, 1963

For further information, check number 7, on page 110

MicroMatch®

Wattmeters for SWR and RF power measurement • Station guardians for automatic transmitter and antenna protection • Dummy loads for transmitter test and alignment.



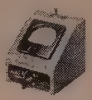
576 SERIES **$60.00**

Bidirectional coupler only, accurately calibrated to read SWR and RF power on a model 412R indicator or SG-33 station guardian.

Frequency Range	Power Range	Model Number
3-30 MCS.	0-1200 WATTS.	576Z2
50-500 MCS.	0-120 WATTS.	576MW
50-500 MCS.	0-400 WATTS.	576KE
50-500 MCS.	0-1200 WATTS.	576MX
50-1000 MCS.	0-12 WATTS.	576MY

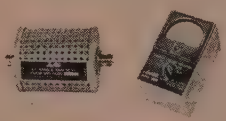
261 **$22.50**

Bidirectional coupler 261, 0.5 to 225 MCS. Power range to 1000 watts. UHF type RF connectors. Complete instructions included to build 262 indicator.



262 **$14.50**

Indicator 262. Use with 261 coupler. Provides readings of SWR and relative RF power. Selector switch provided for reading incident or reflected power.

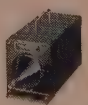


263 **$85.00**

VSWR and RF Wattmeter 263 similar to models 261 and 262 except calibrated to read VSWR and RF power in actual watts on three scales—10, 100, and 1000 watts, full scale.

711N **$135.00**

VSWR and RF Wattmeter 711N. 3 scales 0-30, 75, and 300 watts. Frequency range 25-1000 MCS.



636K **$87.50**

RF Dummy Load 636K. 1 KW continuous power rating, when 240 cubic feet air applied; 600 watts in still air. Other models available for powers of 50, 150, and 200 watts.

SG-33 **$150.00**

Station guardian SG-33 will actuate an alarm and reduce or turn off power to the transmitter whenever load conditions or RF output change sufficiently to threaten damage to the equipment. It responds to a change in SWR and RF power. These functions are also indicated on a meter located on the front panel. The station guardian is designed for use with the 576 series bidirectional couplers.

412R **$50.00**

Indicator 412R is a standard 19" rack panel 3⅜" high. This indicator is designed for use with the 576 directional couplers. It reads forward power and reflected power in watts, and SWR directly on the meter. Meter only also available with complete instructions to build a 412R indicator.

Microwave Devices, Inc.

(Successor to M. C. Jones Electronics Co., Inc.)

SUBSIDIARY OF The Bendix CORPORATION

For further information, check number 30, on page 110

is the self-discipline and pride that prevents phone band pandemonium from taking over all amateur frequencies.

As a radio operator in the Army in Germany I saw little "modern equipment." RTTY equipment that was available did not stand up under field conditions either mechanically or during message handling.

A year of s.w.l. should be mandatory for licensing, to copy the many military and commercial services using c.w. I find it is enjoyable and very good practice.

They should eliminate the Conditional license and make the Extra class standard to preserve amateur radio standing.

William F. Kraft, K9ZNY
416 Oak Street
River Falls, Wisconsin

Editor, *CQ*:

The arguments dealing with Technicians on ten meters bring out many of the foibles of the human being and it is my personal feeling that our whole license structure is in need of a thorough overhauling.

Many amateurs, Generals in particular, make a fetish of the license requirement, insisting that just because they had to pass 13 words it should be stuffed down everybody's throat. Personally, I believe that everyone should know the code and that it should be taught in our schools but as time passes and our technology of communications grows and as the demand for speed increases, code has to take a back seat in the overall picture to phone and the other printed transmission systems.

Those who make a god of code, in spite of its usefulness and their own abilities are just barking up the wrong tree. I think that a check of any band at any time will indicate a preponderance of activity in the phone regions and those who hold out for higher code speeds and more restriction on phone operation whether by class or by other consideration are not being realistic about it.

So far as the Techs on ten are concerned, it is my understanding that the Technicians make up only about 5% of the total amateur group so what possible harm could this small number do to *any* of the bands? It is assumed that the Technician is an experimenter, why not turn them loose on the 80 meter phone band and see if their experimenting won't bear fruit by producing an improvement of some kind here. Certainly they could do no harm!

It may be well to consider the need for a complete revision of our amateur licensing structure to provide a single class of license with a one year probationary period to weed out the "joiners," a low (3 to 5 word) code requirement to satisfy international treaty and provide such emergency services as might possibly be required, and a theory exam which would more or less guarantee proper operation of transmitting equipment. This might well all of it, be conducted by mail, under the penalties of perjury and eliminate added expense to the FCC.

After compliance with these basic requirements, an amateur would be free to take part in whatever phases of the hobby he was interested in. Certainly the field is broad enough for us all and it does not seem to be a very democratic thing to force a hobbyist into doing things he does not want to do just to satisfy the whims of those who have higher qualifications.

After all, whether an operator is a gentleman or a slob is not a matter of license qualifications.

Bob Forman, W9RJH
P. O. Box 68
Monmouth, Ill.

Editor, *CQ*:

I received my Tech License in September and had a Novice license prior to that. This "Techs on Ten" deal is making me angry and very disturbed. I have no opinion in this proposed change, except that I received my Tech license with the understanding that it covered 6 and up. The pros and cons of this proposal are easily available.

ALLICRAFTERS MANAGEMENT:

"Can we build a **quality** receiver, capable of all important coverage from **85 kc through 30 mc,** with at least **3-step variable selectivity,** including a transmitter-type V.F.O. that can be **locked on frequency,** with sensitivity **under 1 μv** on the high frequency range, a high order of **mechanical** and **electrical stability,** that weighs under 20 lb., is extremely compact . . . and will sell for about **$400** ■ ?"

ALLICRAFTERS ENGINEERING:

"Yes."

SPECIFICATIONS

Exceptionally versatile and compact triple-conversion, superheterodyne communication-type receiver. **V.F.O.** can be used as crystal locked oscillator; **Selectivity:** Variable in 3 steps, 0.5—2.5—5.0 kc. Crystal-controlled 1st and 3rd oscillators. Selectable sidebands, constant tuning rate. **Sensitivity:** less than 1 μv on AM, less than ½ μv on SSB/CW. **T-notch** for up to 50 db. attenuation to unwanted heterodyne in I. F. pass band. I. F. type noise limiter. Audio inverse feedback. Crystals provided for 3.5—4.0, 7.0—7.5, 14.0—14.5, 21.0—21.5, 28.5—29 mc. Four addt'l. crystal pos. for 500 kc. segments between 85 kc. and 30 mc. 100 kc. crystal calibrator included. Size: 15" x 7⅛" x 13". Net wt. 18 lb. Amateur net price: $379.95.

HA-10 Low freq. tuner adapts SX-117 for 85 kc.—3 mc. $24.95

dditional searching questions and exciting answers will e coming your way from Hallicrafters soon.

new SX-117 Triple-conversion communication receiver by **hallicrafters**

5th & Kostner Aves., Chicago 24, Ill.

Export: Hallicrafters, International Dept., Commercial Div., **Canada:** Gould Sales Co., Montreal, P.Q.

For further information, check number 22, on page 110

Send for NEW FREE CATALOG #962 with oscillator circuits

Citizen Band Class "D" Crystals

CITIZEN BAND CLASS "D" CRYSTALS
3rd overtone — .005% tolerance — to meet all FCC requirements. Hermetically sealed HC6/U holders. ½" pin spacing. .050 pins. (Add 15c per crystal for .093 pins).

$2.95 EACH

All 23 megacycle frequencies in stock: 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225, 27.255.

Matched crystal sets for ALL CB units (Specify equipment make and model numbers) ..... **$5.90** per set

CRYSTALS IN HC6/U HOLDERS

SEALED OVERTONE .486 pin spacing — .050 diameter — .005% tolerance
15 to 30 MC ..... **$3.85 ea.**
30 to 45 MC ..... **$4.10 ea.**
45 to 60 MC ..... **$4.50 ea.**

FUNDAMENTAL FREQ. SEALED From 1400 KC to 2000 KC .005% tolerance ..... **$5.00 ea.**
From 2000 KC to 10,000 KC, any frequency, .005% tolerance ..... **$3.50 ea.**

RADIO CONTROL Specify frequency. .05 pins spaced ½" (Add 15c for .093 pins). ..... **$2.95 ea.**

QUARTZ CRYSTALS FOR EVERY SERVICE

All crystals made from Grade "A" imported quartz—ground and etched to exact frequencies. Unconditionally guaranteed! Supplied in:

FT-243 holders Pin spacing ½" Pin diameter .093
MC-7 holders Pin spacing ¾" Pin diameter .125
CRIA/AR holders Pin spacing ½" Pin diameter .125
FT-171 holders Pin spacing ¾" Banana pins

MADE TO ORDER CRYSTALS . . . Specify holder wanted
1001 KC to 1600 KC: .005% tolerance ..... **$4.50 ea.**
1601 KC to 2500 KC: .005% tolerance ..... **$2.75 ea.**
2501 KC to 9000 KC: .005% tolerance ..... **$2.50 ea.**
9001 KC to 11,000 KC: .005% tolerance ..... **$3.00 ea.**

Amateur, Novice, Technician Band Crystals

.01% Tolerance . . . **$1.50 ea.** — 80 meters (3701-3749 KC) 40 meters (7152-7198 KC), 15 meters (7034-7082 KC), 6 meters (8335-8650 KC) within 1 KC
FT-241 Lattice Crystals in all frequencies from 370 KC to 540 KC (oll except 455 KC and 500 KC) ..... **50c ea.**
Pin spacing ½" Pin diameter .093
Matched pairs — 15 cycles **$2.50** per pair
200 KC Crystals, **$2.00 ea.**; 455 KC Crystals, **$1.25 ea.**; 500 KC Crystals, **$1.25 ea.**; 100 KC Frequency Standard Crystals in HC6/U holders **$4.50 ea.**; Socket for FT-243 Crystal **15c ea.**; Dual Socket for FT-243 Crystals, **15c ea.**; Sockets for MC-7 and FT-171 Crystals **25c ea.**; Ceramic Socket for HC6/U Crystals **20c ea.**

ENGINEERING SAMPLES and small quantities for prototypes now made at either Chicago or Fort Myers plants with 24 hour service. IN CHICAGO, PHONE GLadstone 3-3555

IF YOUR PARTS DEALER DOESN'T STOCK Texas Crystals, order direct and send us his name.

TERMS: All items subject to prior sale and change of price without notice. All crystal orders must be accompanied by check, money order or cash with payment in full.

RUSH YOUR ORDER NOW TO

TEXAS CRYSTALS

Dept. CQ-2 **Div. of Whitehall Electronics Corp.**
1000 Crystal Drive, Fort Myers, Florida Phone WE 6-2100

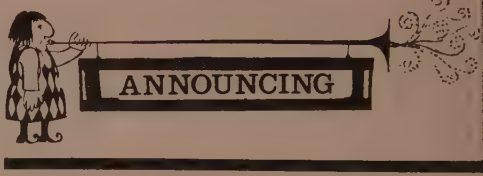
FOR SHIPMENT VIA FIRST CLASS MAIL AT NO EXTRA COST ATTACH THIS ADVT. TO YOUR ORDER!

For further information, check number 31, on page 110

All one has to do is to buy any of the amateur radio publications and open to the editorials and there are the arguments.

I am sorry the whole thing had to be carried this far. No matter what the out-come, everyone loses. If the Techs get Ten, then the Generals, will be forever cursing them. Conversely, if the Techs don't get Ten, they will be forever yelling, "Prejudice"! I am not casting my lot with the Techs or the Generals, but with ALL the amateurs, Extra, General, Techs, Novices, *et al.*

Gene Retske, WA8DSN
612 Hollendale Drive
Kettering 29, Ohio



New England Amateur Award

The Federation of Eastern Massachusetts Amateur Radio Associations will present an award to an outstanding New England amateur radio operator. Only hams in the first amateur call district are eligible and should meet any one of the following qualifications.

1. Performed a meritorius public service to his community through the medium of amateur radio;
2. Made a major contribution to the science of amateur radio;
3. Helped greatly to stimulate interest in amateur radio to others;
4. Aided other radio amateurs to acquire a greater knowledge and skill in operating or building amateur radio equipment.

This honor will be presented at the New England ARRL Convention April 27 & 28, 1963 at the New Ocean House, Swampscott, Mass. and will be made in the memory of the Late John R. Mansfield, W1CMN of Boston whose spirit and comradeship despite great physical handicaps, inspired the award. The award will be known as the John Mansfield Memorial Award and the recipient will receive a cash gift of $150 plus a plaque commemorating the event.

Nominations are urgently requested from the amateur fraternity and they should be complete and accurate. Information on your choice of candidate should be sent at once to the Federation of Eastern Mass. Amateur Radio Associations, c/o Mr. Eli Nannis, W1HKG, 37 Lowell Street, Malden, Mass. The closing date for nominations will be March 15, 1963.

QSLs Wanted

It has taken over a year for K6RXU to dig out of the ruins of the tragic fire which gutted his home and nearly 500 others in Los Angeles in November, 1961. Doc is ready to resume operations and would appreciate it if the gang would look through their logs to determine if he was worked. He lost thousands of QSL cards dating back to 1934 and would like to receive as many as possible. Previous calls were W1HMU, K2BNI, and K2GXV. Doc's QTH is 979 Teakwood Road, L. A. 49, Calif.

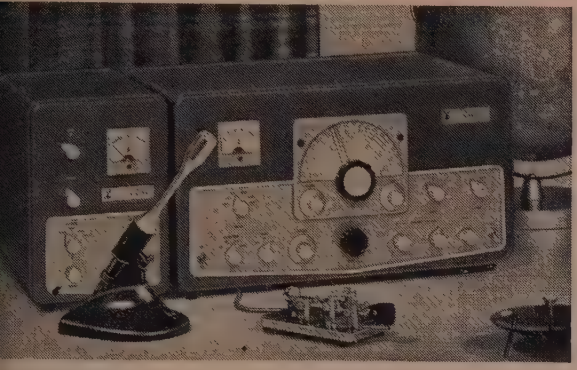
Valley Cottage, N. Y.

The Crystal Radio Club of Valley Cottage, N. Y. will hold its 32nd anniversary dinner on February 2nd. WA2WAM is doing the chores and you may still have time to book a reservation.

Correction

"A Self-Supporting Antenna Mast," November, 1962, page 44, indicates the capacity load of the mast to be 50 pounds. Please correct this to read 30 pounds.

st Choice Among Nation's Amateurs!



Matched Pair

Outstanding performance on SSB, AM and CW with absolutely no compromise on any mode!

B ADAPTER"—The new filter-type SSB generator—bandswitching 80 through 10 meters . . . more than b sideband suppression . . . more than 45 db carrier pression! When used with the Viking "Valiant" or iant II" it places 275 watts P.E.P. at your command. compact units and interconnecting cables . . . RF is only 8" wide—may be placed on your operating . Power supply unit may be placed in any convenient ion. Features built-in multiplier requiring VFO input —band-pass interstage couplers require no tuning—gn and front panel make operating practically fool-f. Superb audio fidelity and balanced audio response; llent sideband, spurious and carrier suppression. r features: positive VOX and anti-trip circuits with -in anti-trip matching transformer and adjustable time delay. With remote power supply, tubes and al filter, less microphone.

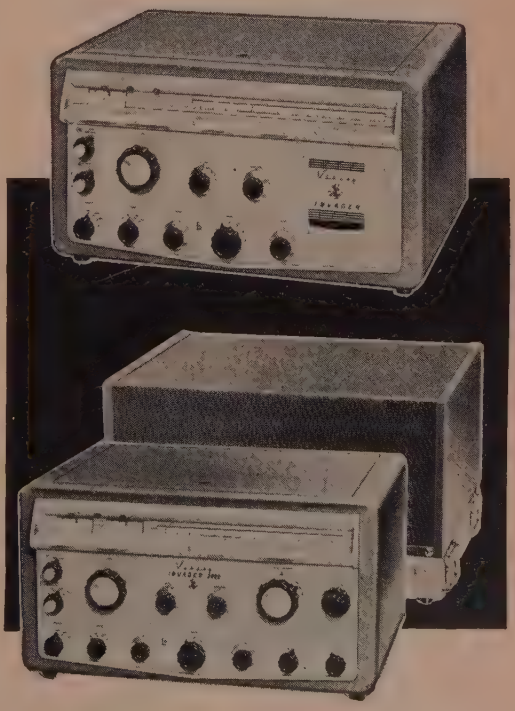
No. 240-305-2—Wired, tested.....Net $369.50

"VALIANT II"—Outstanding flexibility and performance—bandswitching 160 through 10 meters—delivers 275 watts input CW or SSB (with auxiliary SSB exciter or Viking SSB adapter) and 200 watts AM! Low level audio clipping—differentially temperature compensated VFO provides stability necessary for SSB operation! High efficiency pi-network tank circuit—final tank coil silver-plated. Other features: TVI suppression; time sequence (grid block) keying; high gain push-to-talk audio built-in low pass audio filter; self-contained power supply; and single control mode switching. As an exciter drives any popular kilowatt level tubes and provides quality speech driver system for high power modulators. Provision for plug-in SSB operation with no internal modification. With tubes, less crystals.

Cat. No. 240-105-1—Kit.....Net $375.00
Cat. No. 240-105-2—Wired, tested.....Net $495.00

ADER—More exclusive features than any other Trans-er/Exciter on the market today! Specially developed frequency, symmetrical, multi-section band-pass al filter for more than 60 db sideband suppression—e than 55 db carrier suppression! Instant bandswitch-80 through 10 meters—no extra crystals to buy—no gning necessary. Delivers a solid 200 watts CW in-200 watts P.E.P. SSB input; 90 watts input on AM! 80 watts output—upper sideband and carrier). Built-FO—exclusive RF controlled audio AGC and ALC ter type) provide greater average speech VOX and trip circuits. Fully TVI suppressed. Self-contained y-duty power supply. With tubes and crystals.

No. 240-302-2 Wired, tested.....Net $619.50



ADER 2000—Here are all of the fine features of the ader", plus the added power and flexibility of an ral linear amplifier and remote controlled power ly. Rated at a solid 2000 watts P.E.P. SSB, 1000 s CW, and 800 watts AM! (250 to 300 watts output—r sideband and carrier.) Wide range output circuit o 600 ohms adjustable). Final amplifier provides ptionally uniform "Q". Exclusive "push-pull" cooling em. Heavy-duty multi-section power supply. With r supply, tubes and crystals.

No. 240-304-2 Wired, tested.....Net $1229.00

H POWER CONVERSION—Take the features and per-ance of your "Invader" . . . add the power and bility of this unique Viking "Hi-Power Conversion" em . . . and you're "on the air" with the "Invader ". Wired, tested, includes everything you need—no ering necessary—complete conversion in one evening.

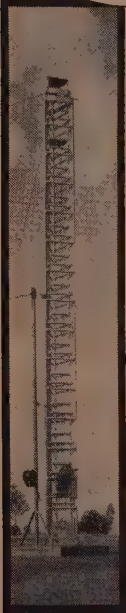
No. 240-303-2.....Net $619.50

E. F. JOHNSON COMPANY
WASECA, MINNESOTA, U.S.A.

®

For further information, check number 8, on page 110

BUY THE FINEST TOWER MADE — BUY TRI-EX!
Tri - Ex
THERE IS A TRI-EX TOWER TO FIT YOUR ANTENNA REQUIREMENTS
Tri - Ex

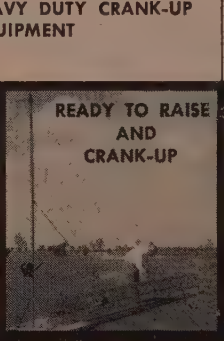


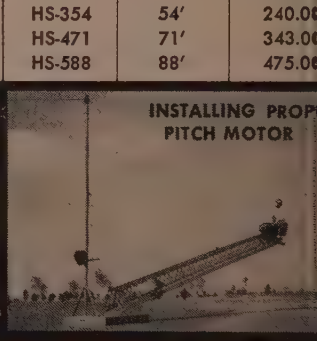
NOW! NEW LOWER PRICES ON ALL GUYED TOWERS
EXAMPLE: TRI-EX H AND HS SERIES GUYED TOWERS WITHSTAN
HEAVY WIND LOADS WITH REALLY BIG ANTENNAS TOPSID

- IRON PHOSPHATE RUST PROOF UNDERCOATING PLUS EPOXY RESIN PRIMER AND BAKED ENAMEL FINISH COAT (GALVANIZED AT SLIGHTLY HIGHER COST)
- ACCOMMODATES ALL PROP PITCH AND OTHER ROTOR MOTORS INSIDE TOP SECTION
- HEAVY DUTY CRANK-UP EQUIPMENT

Model	Height	Price
H-237	37′	$140.00
H-354	54′	190.00
H-471	71′	270.00
HS-237	37′	175.00
HS-354	54′	240.00
HS-471	71′	343.00
HS-588	88′	475.00

NEW! TOWER ERECTION ACCESSORY
Tilt tower to any angle and "work" on your beam antenna SAFELY.
ONE MAN OPERATION





TRI-EX TOWER CORPORATION / 127 EAST INYO STREET / TULARE / CALIFORNIA / MU 6-341

For further information, check number 60, on page 110

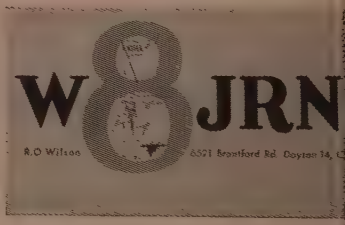
QSL contest

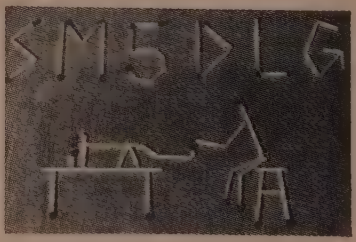
PIERO Purone, I1PP walks away with the honors this month. His card (7¾" × 4½") illustrates an ancient map of the world, in color.

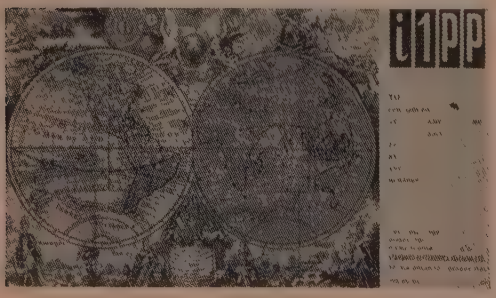
Unfortunately we could not reproduce the "card" from K4YXT. If you happen to get his QSL you'll find it to be a completely hand-made wallet, beautifully tooled with the recipients call, band, *etc.* This is probably the most expensive "card" that's crossed our desk.

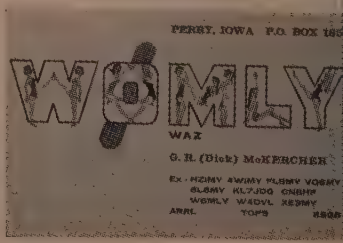
Runners up are W8JRN, SM5DLG and WØMLY. Honorable mention goes to K1UFV, W4SMK, W5OKQ, KN7UWA, W9HPJ and FP8BX.

Address all cards to the QSL Editor, c/o *CQ*.









It's NEW!

A hy-gain MULTI-BAND ANTENNA for 80 thru 10 Meters

Model 18V only $16.95 Ham Net

Now...available for immediate delivery through your favorite Hy-Gain Distributor...Hy-Gain's new, all band vertical antenna...the Model 18V.

Here's a highly efficient, 18 ft. vertical that can be tuned to any band—80 thru 10 Meters—by a simple adjustment of the feed point on the matching base inductor. Designed for 52 ohm coax feedlines, the Model 18V is amazingly efficient for DX or local contact. Highly portable—knocks down to an overall length of 4 ft.—it can be quickly installed on a short 1⅝" mast driven in the ground. It is also adaptable to roof or tower mounting. The Model 18V is a tremendous buy in a self-supporting radiator with multi-band capability. Remember, you can pick one up today from your favorite Hy-Gain Distributor—or, if shipment from a Distributor is necessary, the Model 18V's portability lends itself to low cost Parcel Post shipping charges.

For optimum performance and automatic band switching

Model 14 AVS

The World's Most Popular Vertical

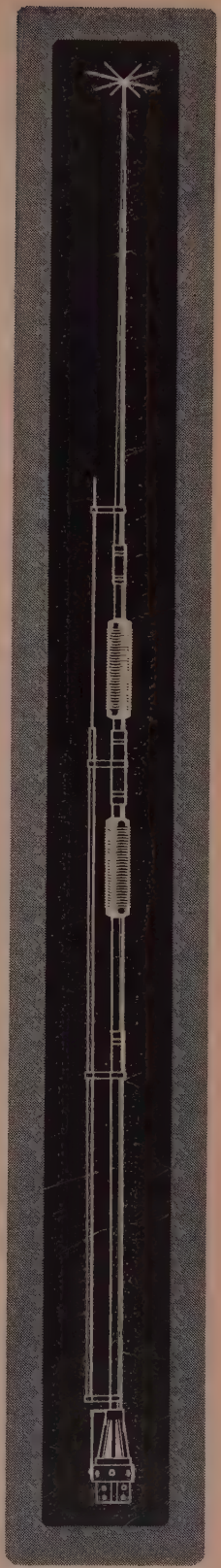
This self-supporting, multi-band, omni-directional antenna is completely factory pretuned to maintain an SWR of 2:1 or less across the entirety of each band. Exclusive Hy-Gain "Slim Line" Traps used in the Model 14 AVS effectively isolate sections of the antenna so that true ¼ wave resonance exists on all bands—makes possible a low angle DX radiation pattern. May be either roof or ground mounted. Quality construction throughout.

ADDITIONALLY... Model 14 AVS may be adapted for 80 M operation by installing Hy-Gain Model LC-80 Loading Coil.

Model 14 AVS.....$29.95 Ham Net
Model LC-80 Loading Coil.....$ 7.95 Ham Net
Model 14 RMK (Roof Mounting Kit)...$11.95 Ham Net

For more complete information, see your favorite Hy-Gain Distributor, or write...

HY-GAIN ANTENNA PRODUCTS 8410 N.E. Highway 6 Lincoln, Nebraska

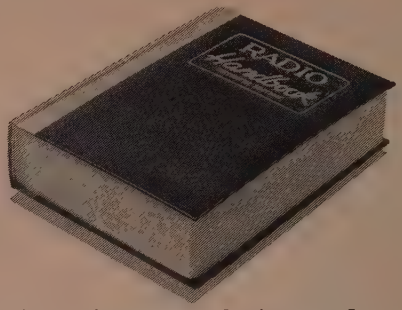


For further information, check number 9, on page 110

USEFUL radio books from E. & E.

"HOW-TO-BUILD" DATA

- the **NEW** (16TH EDITION) Radio Handbook



- New amplifier designs
- New transmitter designs
- New receivers and transceivers

Gives extensive, simplified theory. Provides the latest design and construction data on a wide range of advanced radio amateur equipment, attractively styled. Broadest "How-To-Build" coverage in the field. Completely revised and up to date. Clearly indexed. 805 pages, all text, with hard covers.

$9.50* Book #16R *at your distributor*

CONVERT SURPLUS RADIO GEAR INTO AMATEUR & C. B. EQUIPMENT

A wealth of conversion data in 3 volumes shows you how.

Data includes instructions, photos, and diagrams . . . covers the most commonly available surplus items. Each conversion shown yields a practical piece of equipment—proved by testing.

Items covered are listed below:

SURPLUS RADIO CONVERSION MANUALS — 3 Volumes — $3.00* ea.

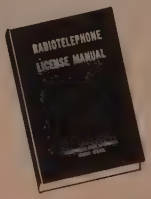
VOLUME I — ARC-5; BC-221, 224, 312, 342, 348, 412 453/455, 457/459, 624/625, 645, 696, 946B, 1068A/1161A; PE-103A; SCR-211, 268/271, 274N, 522, 542, TBY; Electronic Surplus Index; Cross Index of A/N V.T. and Commercial Tubes. Book #31S

VOLUME II — AIC; AM-26; APS-13; ARB (Schematic only); ARC-5; ART-13; ATC; AVT-112A; BC-191, 357, 375, 454-455, 457/459, 946B, 1206; GO-9; LM; R-26-27/ARC-5; R-28/ARC-5; SCR-274N; TA-12B/12C; TBW; T-23/ARC-5; Selenium-Rectifier Power Units; Simplified Coil-Winding Data; Surplus Beam Rotating Mechanisms. Book #32C

VOLUME III — APN-1; ARC-5; ART-13; BC-191, 312, 342, 348, 375, 442, 453, 455, 456 to 459, 603, 624, 696, 1066, 1253; CBY-52000 series; COL-43065; CRC-7; DM-34D; DY-8 or DY-2A/ARR-2; FT-241A; LM; MBF; MD-7/ARC-5; RM-52, 53; R-9/APN-4; R-28/ARC-5; RT-19/ARC-4; RT-159; SCR-274N series; SCR-508, 522, 528, 538; T-15 to T-23/ARC-5; URC-4; WE-701-A. Schematics only: APA-10; APT-2; APT-5; ARR-2; ASB-5; BC-659, 1335A; CPR-46ACJ. Book #33M

THE SURPLUS HANDBOOK (Receivers and Transceivers) — **$3.00* ea.**

VOLUME I — Schematic Diagrams and large photographs only — APN-1; APS-13; ARB; ARC-4; ARC-5 (L.F.); ARC-5 (V.H.F.); ARN-5; ARR-2; ASB-7; BC-222, 312, 314, 342, 344, 348, 603, 611, 624, 652, 654, 659, 669, 683, 728, 745, 764, 779, 794, 923, 1000, 1004, 1066, 1206, 1306, 1335; BC-AR-231; CRC-7; DAK-3; GF-11; Mark II; MN-26; RAK-5; RAL-5; RAX-1; SCR-522; Super Pro; TBY; TCS; Resistor and Capacitor Color Codes; Cross Index of A/N V.T. and Commercial Tubes. Book #51H



RADIOTELEPHONE LICENSE MANUAL

$5.75* Book #03L

Helps you prepare for all U.S.A. commercial radiotelephone operator's license exams. Provides complete study-guide questions and answers in a single volume. Helps you understand every subject needed to obtain an operator's license.

Every Electronic Tube in the World Listed — 3 Volumes

WORLD'S RADIO TUBES
(Brans' Radio Tubes Vade Mecum). World's most complete and authoritative book of v.t. characteristics Book #47B **$8.00***

WORLD'S EQUIVALENT TUBES
(Brans' Equivalent Tubes Vade Mecum). Over 43,900 comparisons and replacements (#46W) **$6.00***

WORLD'S TELEVISION TUBES
(Brans' Television Tubes Vade Mecum). Characteristics of all TV picture and cathode ray tubes . . . also special purpose electronic tubes (#45P) **$6.00***

***Order from your favorite electronic parts distributor.**

If he cannot supply, send us his name and your remittance, and we will supply; foreign, add 10%.

EDITORS and ENGINEERS, Ltd.
Summerland 3, California

Dealers: Electronic distributors, order from us. Bookstores, libraries, newsdealers order from Baker & Taylor, Hillside, N. J. Export (exc. Canada), order from H. M. Snyder Co., 440 Park Ave. So., N.Y. 16.

C-P COMMUNICATION ANTENNA SYSTEMS

—mean CERTIFIED PERFORMANCE!

rical Specifications:

input impedance	50 ohms
gain	10 db
back ratio	20 db
power input	250 watts
feedline	RG-8A/U
erminal extension	18" of RG-8A/U
ion	Type N male with Neoprene housing
	1.5:1
h	±3%
protection	Direct ground

anical Specifications:

(size per side)	2' x 2'
material	High strength aluminum alloy
element material	High strength aluminum alloy
element diameter	⅜"
nd velocity	100 MPH
hrust at rated wind	16 lbs.
moment on mounting pipe	16 ft. lbs.
	8 lbs.

Stainless steel hardware supplied to mount antenna on 2" IPS pipe.

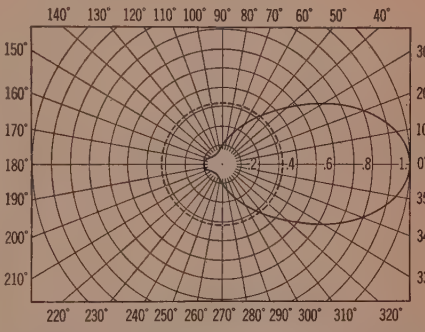
Base Station Corner Reflector Advanced Design Antenna

(10X-Unidirectional Gain)

Cat. No. 161-509, Frequency Range 450-470 MC

Cat. No. 161-509 Corner Reflector Antenna is designed for use in the 450-470 Mc band. All reflector screen components are manufactured of high strength aluminum alloys, all mounting components are fabricated of hot-galvanized steel and all radiating components are fabricated of aluminum. The above combine maximum strength, optimum electrical performance and minimum weight for the first time in an antenna of this type.

This lightweight aluminum antenna is ideal for use in multiple corner arrays.



Horizontal field strength pattern of Corner Reflector 10X-Gain Antenna Cat. No. 161-509. A dipole pattern is shown for reference.

SINCE 1933

COMMUNICATION ANTENNA SYSTEMS FOR AMERICAN BUSINESS

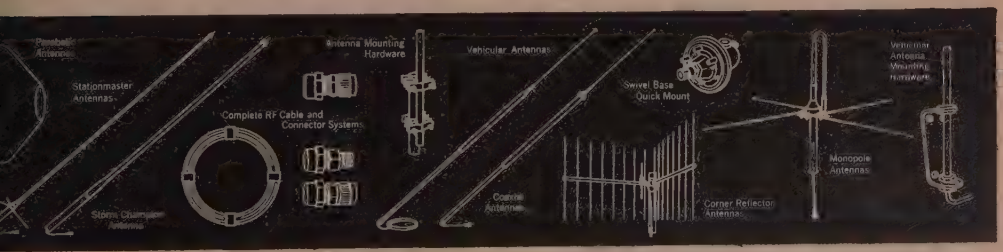
Communication Products Company

DIVISION OF

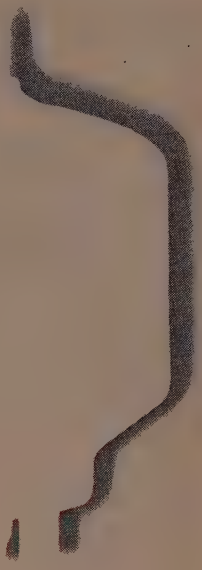
PHELPS DODGE ELECTRONIC PRODUCTS CORPORATION

MARLBORO, NEW JERSEY — Telephone HOpkins 2-1880 (Area Code 201)

LOS ANGELES 65, CALIF. — Telephone CHapman 5-1143 (Area Code 213)



SSB TUBES DON'T JUST HAPPEN



From its radiation-cooled graphite anode and all-glass envelope, to its unique internal structure, the new Amperex 8179 Tetrode was designed from concept through accomplishment to be a better SSB linear amplifier than any other tube ever before available in its power class.

THEY

How well Amperex has achieved its objective is expressed in the significant facts that the 8179 will provide **more power, with lower intermodulation distortion, at higher operational efficiency** than ever before attainable in SSB linear service—and we mean **linear!**

The highly efficient heat radiation properties of the 8179 eliminates the need for costly, space-consuming cooling fans, blowers and related accessories. The tube incorporates a thoriated tungsten filament with high reserve emission rated at 7.5 volts and 22.6 amperes.

HAVE TO BE

DESIGNED FOR SSB

Class AB1 Grounded Cathode Linear RF Amplifier
Single Sideband Suppressed Carrier Operation
Typical Operation at 2 Kw PEP Input

DC Plate Voltage	4000 volts
DC Grid No. 2 Voltage	600 volts
Zero Signal DC Plate Current	150 Ma
Max. Signal DC Plate Current	515 Ma
Max. Signal DC Grid No. 2 Current	115 Ma
Tube Efficiency at Peak of Envelope	68%
Average DC Plate Current (two tone test)	360 Ma
Average DC Grid No. 2 Current (two tone test)	60 Ma
Peak Envelope Plate Power Output	1410 Watts
3rd Order Intermodulation Distortion	34 db
5th Order Intermodulation Distortion	38 db

For complete data on this and other transmitting tubes, write: Amperex Electronic Corporation, Communication and Industrial Tube Department, Hicksville, Long Island, New York.

Ask Amperex

IN CANADA: PHILIPS ELECTRON DEVICES, LTD., TORONTO 17, ONTARIO

check number 50, on page 110

Random Thoughts———

From the Boys in the Back Room

The advertising in a magazine such as *CQ*, in addition to being the main source of income, represents two important factors. These are:

1. The express desire of the advertiser to sell his product or service to the publication's audience.

2. The advertiser's confidence that the publication in which he spends his advertising dollar will be a worthwhile business investment.

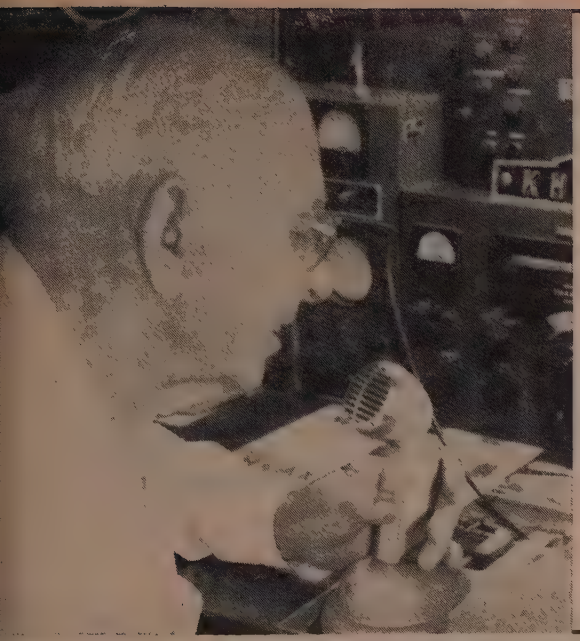
The old, established advertiser who has been using a specific publication over a period of many years knows that his results are a cumulative effort of many ads, and that he builds an image and an identity with his ads as well as an increase in his sales curve. The relative newcomer to the advertising group too often expects his first ad to produce a miracle avalanche in sales, not realizing that the public often waits to see if the company is going to survive before gambling on a new product from a new firm.

We know from experience, however, that when a new manufacturer enters the Amateur field with a quality product at a fair price, that *CQ*'s readers are quick to recognize a good buy. This means that the advertiser *can* expect a profitable return on his ads from the very beginning. His business grows accordingly, and we have added a steady reliable name to our advertising index.

Unfortunately, not all new firms desiring to reach the Amateur fraternity always come to *CQ* first with their initial ad campaign. Some try the other well-established publication first on the assumption that they'll be getting prestige by seeing their ad in "the official publication." Others try much smaller newcomer periodicals because "they're just plain cheap." In either case, these advertisers may or may not make a go of it. The successful ones eventually end up in *CQ* anyway. The unsuccessful ones aren't around to find out what would have happened if they had tried *CQ* first.

The most important thing for the new advertiser to consider is this: The only accurate measure of a magazine's *real ad cost* is the number of readers who see his ad and the number of dollars he must spend to reach each thousand readers. *CQ* is now read by as many or more active amateurs today than any other publication, and at least four or five times as many as the publications which are "just plain cheap." Our ad rates are by far the lowest in the entire Amateur radio market based on the above-mentioned *cost-per-thousand basis* of evaluation.

More young businesses are trying *CQ first* these days. More newcomers are making a success of the Amateur radio market than ever before. Doesn't your ad belong in *CQ?* Advertising in *CQ* doesn't cost . . . it pays!



KH6AR
Wahiawa, Oahu, Hawaii
reports:

"most natural sounding SSB mike yet"

We'll let Ken Bryan's (KH6AR) letter to us speak for itself:

"I've been using my Shure 440SL on regular skeds with people who know my voice from eyeball QSO. That includes my daughter who doesn't ordinarily like the tone of sideband. Everybody tells me that it's the most natural sounding SSB mike yet . . . especially my daughter.

"The pick-up is great. The tendency of local splatter and unwanted sideband is *considerably* reduced over three other mikes I compared it with. Humidity doesn't affect it at all. All in all, I feel it's the best SSB mike I've ever had, including one that cost me over $50.00!"

ONLY **$28.50** net

(complete with stand, grip-to-talk switch, 7 ft. highest quality 2 conductor shielded cable.)

A87K Modification Kit. *Instant switching from VOX (with muted microphone position) to push-to-talk. $3.25 net.*

SHURE 440SL

CONTROLLED MAGNETIC SSB, AM, FM MICROPHONE

Literature: Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Illinois

For further information, check number 34, on page 110

CUT HOLES FAST

GREENLEE CHASSIS PUNCHES

Take accurate, finished holes in 1½ minutes or less in metal, hard rubber and plastics. No tedious sawing or filing—a few turns of the wrench does the job. All standard sizes . . . round, square, key, or "D" shapes for sockets, switches, meters, etc. At your electronic parts dealer. Literature on request

GREENLEE TOOL CO. GREENLEE
2028 Columbia Ave., Rockford, Illinois

For further information, check number 35, on page 110

DK71

DK71
with UHF Connector
$49.50

SINGLE POLE, SIX-THROW

COAXIAL RELAY

FOR MOUNTING ON MAST AND REMOTE SWITCHING UP TO 6 ANTENNAS!

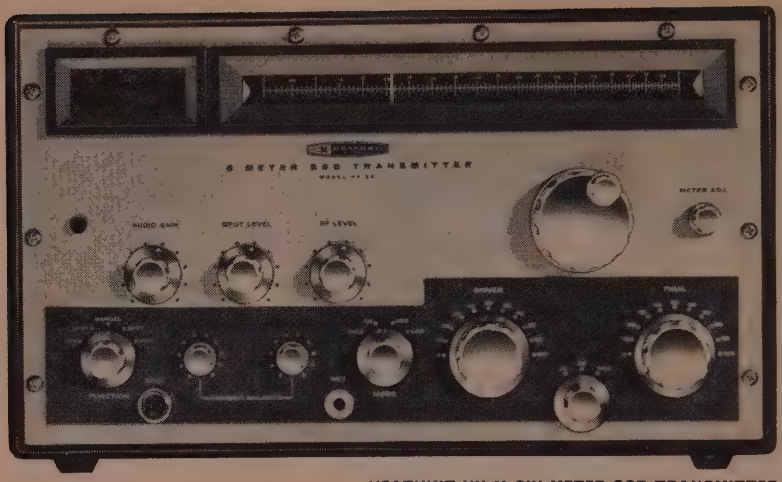
Available in various coil voltages

Weatherproof, electro-magnetic, less than 1.1:1 VSWR at 100 mc, 1 kw power rating, available in UHF, N, BNC, TNC & C connectors. Continuous duty, over 1,000,000 operations. 5-¾" x 2-¾", silver plated connectors.

✱ See distributors in U. S. and Canada or write:

Manufactured and Guaranteed by **DOW-KEY COMPANY**
THIEF RIVER FALLS, MINNESOTA

For further information, check number 36, on page 110



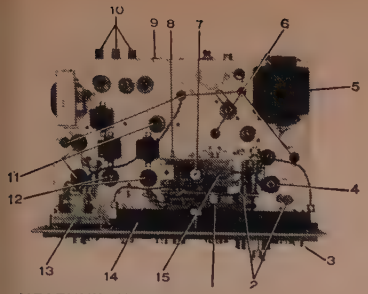
HEATHKIT HX-30 SIX METER SSB TRANSMITTER

SSB SIX PACK

A NEW EXCITER & AMPLIFIER FOR 125 WATTS PEP ON S

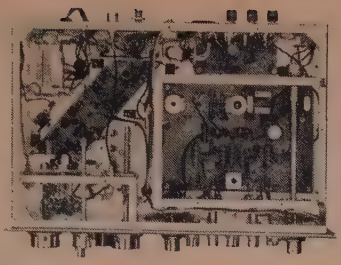
HEATHKIT by Daystrom

HEATHKIT HA-20 SIX METER LINEAR AMPLIFIER



HEATHKIT HX-30
SIX METER SSB TRANSMITTER

1. Anti-backlash helical gear for smooth VFO tuning. **2.** Adjustable final amp. coupling and loading. **3.** Meter control with push-button over-ride to check carrier null. **4.** 6360 final amplifier for 20 watt PEP RF input. **5.** Regulated power supply. **6.** Five test-point jacks for easy alignment using panel meter. **7.** Low frequency heterodyne VFO electronics on circuit board. **8.** VFO frequency determining components mounted on "heat-sink" plate in enclosure. **9.** Accessory socket for control functions. **10.** Built-in VOX & anti-trip circuitry. **11.** Three audio stages with speech filter. **12.** Phasing type SSB generator heterodyned to output frequency. **13.** Meter indicates relative power output. **14.** Lighted slide-rule dial with 9" per megacycle of bandspread. **15.** Two crystal sockets for net or MARS operation (provides frequency coverage down to 49.8 mc).

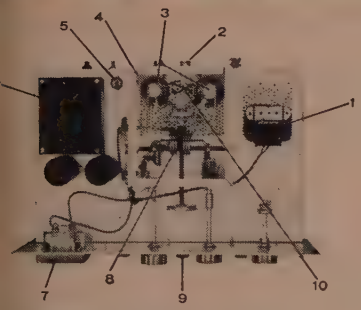


TAKES LESS THAN 30 HOURS TO ASSEMBLE: 3 extra-strength circuit boards and 3 precut, cabled wiring harnesses simplify assembly and insure correct parts placement. Compartmentalized construction and thorough shielding assure stable, reliable performance. Advanced design features provide 50 to 54 mc coverage in four 1 mc segments (crystal for 50 to 51 mc supplied); USB, LSB, CW, AM operation; 50 db carrier suppression; 40 db unwanted sideband suppressions; grid block keying with filter; 50-75 ohm coax output and many more. Overall dimensions only 16⅝" W x 10⅛" H x 10" D.

Kit HX-30, 50 lbs., no money down,
$18 mo.....**$189.95**

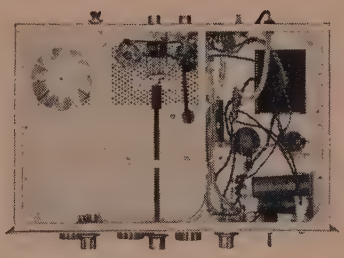
SSB SIX PACK as low as $27 per mo.

Attention all six-meter fans! Here's another Heathkit first! A brand new SSB exciter and linear for six meter operation at sensational savings! Only $289.90 for the pair . . . less than the cost of most transverters. Together they form a complete, high performance 6-meter SSB station designed for maximum efficiency and operating convenience. Check the many features of these two units . . . you'll find them the perfect pair for your station . . . enter your order today and go SSB on Six!



HEATHKIT HA-20
SIX METER LINEAR AMPLIFIER

1. Fan forced-air cooling of final amplifier. **2.** Only 2.5 to 10 watts PEP driving power required. **3.** 125 watts PEP input. **4.** Completely shielded RF circuitry. **5.** Regulated screen voltage. **6.** Solid-state rectifiers for cool, efficient operation. **7.** Metered grid current, plate current, plate voltage & relative power output. **8.** Link coupled RF output, 50-75 ohm coaxial. **9.** 50 ohm tuned grid input to accommodate various levels of driving power. **10.** Neutralized push-pull 6146 final amplifiers.



EASY ASSEMBLY: Clean, open circuit layout permits conventional wiring with less than 10 hours actual construction time. As in the HX-30, a heavy steel copper-clad cabinet provides strength, beauty and superior shielding, measures just 16⅝" W x 10⅛" H x 10" D. Frequency coverage is 49.8 to 54 megacycles. All power supplies are built in. A tremendous value at this low Heathkit price!

Kit HA-20, 43 lbs., no money down,
$10 mo.....**$99.95**

FREE 1963 HEATHKIT CATALOG
New edition — more than 100 new kits since last issue — over 250 kits in all.

HEATHKIT by Daystrom

HEATH COMPANY
Benton Harbor 12, Michigan

Please Send FREE 1963 Heathkit Catalog

Name _____

Address _____

City _____ Zone _____ State _____

For further information, check number 10, on page 110

The Overtone-Harmonic Crystal Oscillato

BY FRANK C. JONES*, W6AJF

The old fashioned "oscillator string" in v.h.f. converters may be a thing of the past thanks to this new oscillator circuit. An ordinary overtone crystal may be used to provide outputs in the 100-150 mc region with only one tube or transistor. An excellent 2 meter converter is described using the new circuit.

THE odd name of this crystal oscillator is an attempt to classify its unusual operation. Nearly all oscillators either work towards a harmonic output of the fundamental frequency of the crystal, or at an overtone frequency of this fundamental. This new oscillator does both; it oscillates at the third overtone of the crystal, then multiplies to the second or third harmonic of this overtone frequency. One triode tube or one transistor does the usual work of two in the design of crystal controlled v.h.f. or u.h.f. converters for receivers.

The circuit shown, fig. 1A is about as simple as can be designed, considering the functions involved. The circuit oscillates at the overtone frequency, 43.333 mc for example, in the cathode of the 6AK5. The values of L_1 and C_1 are not critical but should resonate at from 20 to 30 mc when using third overtone crystals of 35 to 48 mc. L_1 varied from 1 to 10 microhenrys in the test circuits with a small variable condenser of 5 to 30 mmf for C_1. It was found that values near 1 microhenry were too small for some tubes and crystals. A 4 microhenry radio frequency choke coil seemed to work effectively with all overtone crystals in the range tested (from 20 to 48 mc). The lower frequency crystals required a little increase in C_1 value for maximum output at the second or third harmonic of 40 to 96 mc, and 60 to 144 mc, respectively. The values of C_2 and L_2 should resonate at the desired output frequency with either C_2 or L_2 being variable in order to take up the tube capacity and the detuning effect of C_1.

In the writer's tests the main work has been done with 43.3333 mc third harmonic crystals producing 130 mc output for coupling to a mixer. This provides the usual 14 to 18 mc i.f. output for the 144 to 148 mc amateur band. Since the tube or transistor does produce harmonics, the Q of L_2-C_2 should be as high as practical design will allow. Otherwise undesired harmonics will reach the mixer circuit and produce spurious signal responses from strong signals well outside of the desired amateur band. Good design would seem to indicate the use of two medium Q circuits tuned to the output frequency, lightly coupled together with about ½ mmf coupling capacity. The second tuned circuit would then be coupled to the mixer. The added selectivity at 130 mc would add 20 db or more of attenuation to the undesired second and fourth harmonics, 86.666 mc and 173.333 mc. A single high Q circuit at 130 mc will do a fair job, but two circuits make the problem easier to solve.

Many different tubes were tested in this circuit. The two types that produced the greatest output voltage at 130 mc were a 6AK5 triode-connected and a 6CW4 nuvistor triode. An arbitrary value of ¼ watt input was chosen, in comparing tubes. A variable B+ supply and 0 to 5 ma plate current meter were employed. In general, the triodes with highest G_m at low values of plate current functioned best in this circuit. The 6AK5 and the 6CW4 produced from two to three times as much output at 130 mc as could be obtained from over a dozen triodes tried. Tubes such as 6BH6 and 6AU6 functioned fairly well when operated as screen grid tubes with the screen tied to the plate coil bypass condenser. On the other hand, 6AK5s gave more output as triodes than as screen grid tubes in the tests to date.

This circuit requires good active overtone

*850 Donner Ave., Sonoma, Calif.

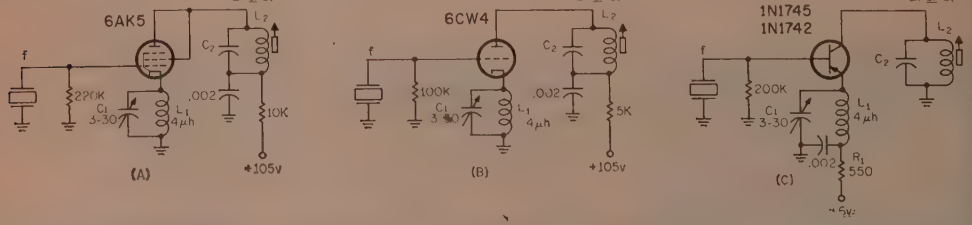


Fig. 1—The overtone-harmonic crystal oscillator using a standard receiving tube (A), a nuvistor (B), and a transistor (C). Third overtone crystals in the 35-48 mc range require L_1 and C_1 to resonate between 20 and 30 mc. Output tank L_2-C_2 should resonate at the desired 2f or 3f frequency.

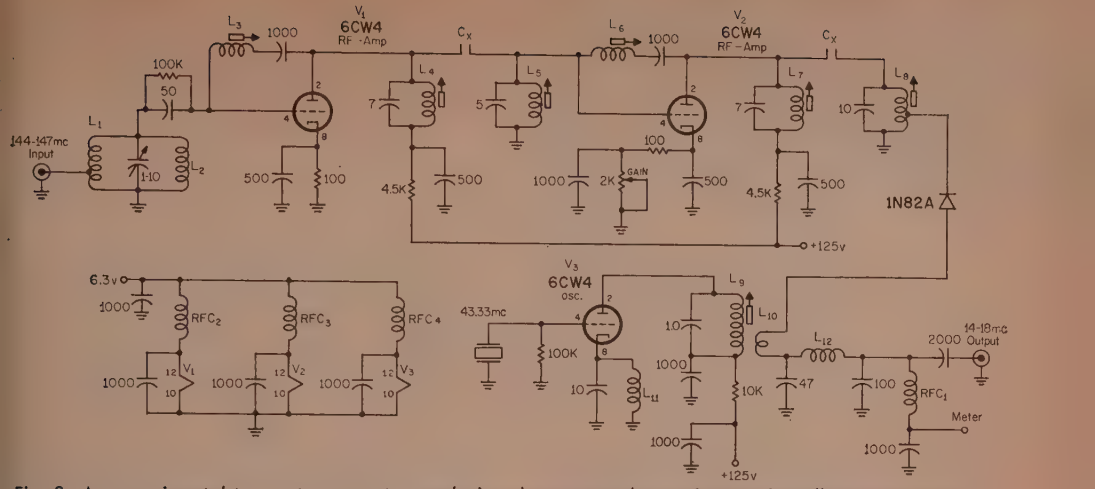


Fig. 2—An experimental two meter converter employing the overtone-harmonic crystal oscillator to produce 130 mc local oscillator output from a 43.333 mc overtone crystal. This circuit, although usable is not the ideal since the inductive method of neutralization used is quite critical. A more practical circuit is shown in figure 3.

C_x—"Gimmick" capacitors. See text.
L_1, L_2—6t. #18e. 3/16" dia. 1/2" l. Tap L_1 2 turns from ground.
L_3, L_6—Neutralizing coils. 18t. #26e. 3/16" dia. 3/8" l. on ferrite slug coil form.
L_4, L_5, L_7, L_8—4t. #18 or #20 d.c.c. 1/4" dia. 1/4" l. on ferrite slug coil form. Center tap L_8 only.
L_9—7t. #22e. 1/4" dia. 1/4" long on ferrite slug coil form.
L_{10}—1t. link of hookup wire on L_9.
L_{11}—4 μh r.f. choke.
L_{12}—3 μh r.f. choke.
RFC_1—0.5 mh r.f. choke.
RFC_2, RFC_3, RFC_4—10t. hookup wire closewound 1/16" dia.

crystals for best results. Ten fundamental frequency crystals at about 11 mc were available for test. About one third of these would oscillate at the third overtone and produce a small output near 130 mc, the fourth harmonic of the overtone frequency. The cathode feedback system is not a very efficient means of making a crystal oscillate at third overtone, so regular overtone crystals are necessary and tubes such as the 6AK5 or 6CW4 are preferable.

The transistorized circuit of fig. 1C functions in the same manner with very good third harmonic output at 130 mc when using third overtone 43.333 mc crystals. A diode r.f. voltmeter connected across the collector circuit, L_2-C_2 indicated output voltages of from 1 to 5 volts peak when using an 8.4 volt battery supply. This was less than half as much as obtained from a 6AK5 but the input power was considerably less than one half as much. This indicates better system efficiency for transistors, even neglecting tube heater power loss.

Several types of Philco transistors were tested in the circuit of fig. 1C. The surplus type marked T2040, supposedly a 250 mc cutoff type, gave about twice as much 130 mc output as other types tested. No complete measurements were made as to exact input and output power. The 2N1745 transistor worked as well as the 2N1742 and 2N1744 so at the price differential, the 2N1745 had preference. A 50 mc cut-off type 2N1728 would produce some output at 130 mc but only about one third as much as a 2N1745. Since the circuit was set up for 130 mc output, transistors designed for v.h.f. or u.h.f. are necessary.

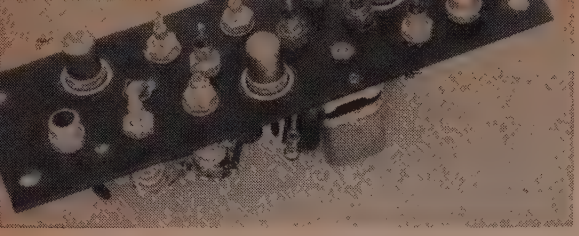
In fig. 1C, the connection between L_1 (4 microhenrys) and R_1 should be bypassed as shown. If no bypass is used, R_1 will offer enough impedance at the fundamental frequency of the crystal (approximately 14.5 mc for 43.333 mc overtone crystals) so oscillation will take place at about 14.5 mc. The 130 mc output would then be greatly reduced. A radio receiver was used to check on 14.5 mc and 43.3333 mc oscillation. The latter frequency is necessary since the transistor or tube only has to multiply by three. Asking it to multiply by nine is too much!

The output circuits shown do not indicate any method of coupling to another circuit or to a mixer. The usual forms of inductive or capacitive coupling are suitable.

Overtone crystals are low-power type devices, so are suited for use in receiver convertors where the r.f. power requirements are usually less than a milliwatt or two. When this circuit is used in a transmitter it should be followed by a high gain amplifier since an attempt to get a good fraction of a watt from this system will lead to crystal overheating and poor frequency stability. As long as the required output is in the low milliwatt region, excellent frequency stability can be obtained for either receiver or transmitter circuits.

Prototype Two Meter Converter

The 144 mc converter shown in fig. 2 was built and used for a few weeks. It had good gain and low noise characteristics but was difficult to adjust properly. Because of the loss in the diode mixer, gain has to be added in some other part of the converter when it is to be used with



Overall view of the 2 meter converter showing par placement. The three objects placed among the slu tuned coils and capacitors are feedthrough type capa itors used in this case as bypasses. Input is at the righ

moderate gain communication receivers. One r.f. stage and one i.f. stage in a converter unit would be much less regenerative than one with two r.f. stages, but would have less image rejection. From four to six tuned circuits in the 144 mc band are needed to reduce image signals to a low value when using the 14 to 18 mc i.f. tuning range in the main receiver.

The two stage converter shown here has five tuned circuits with an operating Q of 15 or less. The input circuit for the best noise figure should be operated at low Q and tuned to the low side of the band or even below the band, so its image rejection effect is nearly lost. This doesn't mean that the tuned circuit without antenna and grid loading shouldn't be high Q. Heavy wire in the coil also more effectively grounds very strong input signals directly in the i.f. range of 14 to 18 mc. A high Q here and in the other circuits, compared to the loaded Q, means less loss of the desired weak two meter signal.

This converter has two nuvistor r.f. stages with inductive neutralization, a 1N82A diode mixer and a single nuvistor crystal oscillator. The inductance neutralization system is critical in adjustment even in one r.f. stage and becomes a real chore with a two stage system. The three slug tuned circuits in each stage have to be experimentally adjusted and the degree of coupling into and out of each stage has to be varied in order to cover several megacycles bandwidth. The neutralizing coils from grid to plate are always adjusted for minimum signal feedthr from a signal generator and without plate voltag applied to the r.f. stages. The r.f. coils are peake for maximum signal. These adjustments seen to interlock and since inductance neutralizatio of this type is theoretically only perfect at on spot frequency, the problem of getting severa megacycles bandwidth is not easy. It took th writer several hours work to get about three m bandwidth with stable operation in the uni shown here. The coupling capacitors betwee pairs of tuned circuits had to be adjusted als as well as antenna coupling tap and diode mixe tap. Shield partitions between r.f. stages did no seem to be of much use since the coils wer spaced well apart and the bypass condensers *etc* in each stage were stacked up in the space be tween grid and plate circuits. The unit was buil on a piece of copper-clad bakelite 2 × 6 inche in size.

A Practical Converter

This unit was finally discarded in favor of th unit illustrated in fig. 3. A change in s.w.r. in th antenna feeder with weather changes or pointin the two meter beam antenna into another nearb antenna or tree seemed to upset the input r.f stage on the first unit enough to cause r.f. oscil lation. The two stages of r.f. also produced prob lems when a new high powered two mete transmitter came on the air nearby. The inter modulation effects were bad and the modulatio

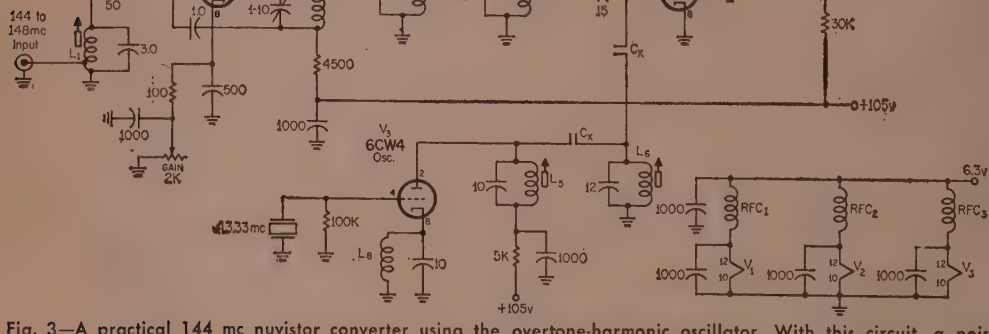


Fig. 3—A practical 144 mc nuvistor converter using the overtone-harmonic oscillator. With this circuit, a nois figure on a par with a 417A converter can be expected. All capacitors are in mmf and all resistors are ½ wat

C_x—"Gimmick" capacitors. See text.
L_1—5t. #20 d.c.c. ¼" dia. ¼" l. on ferrite slug coil form.
L_2—6t. #18e. ¼" dia. ¼" l. air wound.
L_3, L_4, L_5, L_6—4t. #20 d.c.c. ¼" dia. 5/16" l. on ferrite slug coil forms.
L_7—20 μh TV video peaking coil. Miller 6152.
L_8—4 μh r.f. choke.
RFC_1, RFC_2, RFC_3—10t. hookup wire close wound ⅛ dia.

Underchassis view of the 144 mc nuvistor converter using the Overtone-Harmonic crystal oscillator. The input is at the far right with the piston-type r.f. amplifier plate tuning capacitors can be seen to the left of the 6DS4 socket. The 6CW4 oscillator is at the corner of the copper-laminate board chassis.

rode in on carrier signals across the whole two meter band.

The converter shown in fig. 3 has much better stability with some sacrifice in image rejection. The overall gain of the two converters was comparable and the noise figure about the same, however the adjustments in the one-r.f.-stage unit were easily made and the bandwidth was greater. The gain over the whole two meter band was much more uniform and changes of antenna s.w.r. had no adverse effects on regeneration, only on noise figure. The unit shown here was tried with inductive neutralization but due to spot frequency effects, neutralization was not effective over the whole two meter band unless the operating Q of the tuned circuits was reduced to such a low value that image rejection became poor. Capacitive bridge neutralization of the triode r.f. stage has a nice wide bandwidth and the operating Q could be made high enough so the four tuned circuits produced over 60 db of image rejection.

The nuvistor mixer has considerable gain as compared to quite a bit of loss in a diode mixer, so one r.f. stage produces enough overall converter gain for most communication receivers tuning the range of 14 to 18 mc. One r.f. stage with a gain control especially if a remote cutoff type 6DS4 nuvistor is used in place of a 6CW4 nuvistor, takes care of intermodulation problems from nearby two meter stations. This gain control, a 2000 ohm potentiometer, is external to the converter in order to use it if needed when other local stations come on the air.

This converter, on a 2 × 6 inch copper clad bakelite strip, was mounted in an inverted 17 × 5 × 3 inch chassis in back of the communication receiver. Several other similar converters for other amateur bands were mounted in this chassis along with a small regulated power supply delivering 105 volts up to 20ma of plate power and 6.3 volts a.c. up to 1 ampere for heater circuits. A two section switch changes heater supplies and i.f. outputs to the receiver. Each converter connects to its own antenna so no switching is required on the inputs.

In testing this converter of fig. 3 a grid dip oscillator is useful in aligning the tuned circuits to the approximate frequency. The four r.f. circuits were aligned to about 145 or 146 mc and the two oscillator coils adjusted to 130 mc before connecting the unit to a power supply. The r.f. stage plate tuning condensers were adjusted for about equal capacities in this step. A test signal generator in the two meter band is used in the remaining tests. The unit is then connected to the power supply with the r.f. gain control disconnected entirely. A strong signal input will produce a signal in the i.f. output range if the crystal oscillator is functioning. Fortunately this type of oscillator has a fixed oscillator circuit for the 43.333 mc overtone crystal so if the wiring is correct it will oscillate weakly at 43.333 mc in the cathode and grid circuits of the nuvistor oscillator tube. The plate circuit and its loosely coupled circuit are then peaked to produce maximum signal in the receiver from the test signal generator. Two tuned circuits of moderate Q were used to make sure that only the third harmonic of 43.333 mc (130 mc) was coupled into the mixer grid circuit. Too much oscillator injection voltage will usually produce spurious responses somewhere in the 14 to 18 mc output range; too little reduces the converter gain and causes some loss in noise figure also. The "gimmick" coupling condensers, short pieces of insulated hook-up wire are twisted together to produce coupling capacities in the range of 0.25 to 1.5 mmf. A 0.5 mmf capacitance requires a single twist with small hook-up wire but with small conductor heavily insulated wire one or two twists may be needed.

A larger capacitor of from 0.66 to 1.0 mmf is needed for coupling between the r.f. plate circuit and the next slug tuned circuit since the circuit is approximately center-tapped by the two tuning condensers and associated shunt capacities. Neutralizing is accomplished by adjustment of each plate condenser running one in and the other out by equal amounts so as to maintain correct two meter resonance. By unbalancing these two capacitors, a fixed 10% ceramic 1 mmf capacitor can be used to neutralize the nuvistor triode grid to plate capacity of about 0.9 or 0.95 mmf. If both plate condensers are adjusted simultaneously in opposite directions one can watch the receiver S-meter indication for best neutralization. For any one setting on one condenser, the other is adjusted for maximum S-meter reading. Then adjust in small steps until the S-meter reading is at a minimum. The unit shown was adjusted in this manner. Then when the r.f. gain control lead was connected and the gain control set at zero resistance, a 40 db increase of signal resulted—about seven points on the meter.

The input circuit and antenna tap are always adjusted for best signal to noise ratio or noise figure. This means tuning this circuit not for maximum gain but for best noise figure. The circuit will be set near 144 mc for best noise figure over the 144 to 148 mc range. The two slug circuits between the r.f. stage and mixer

[*Continued on page 90*]

Automatic RTTY *And* C.W. With Multi-Gates

BY C. L. HANSEN*, WØASO

WØASO's station uses "multigates" in a semi-automated station operation set-up for both c.w. and RTTY. Designed primarily for contest operation, this pushbutton operated station allows the operator to relax and keep a neat log. Automatic CQs can be transmitted on c.w. or RTTY with breaks for manual inserts of variable information.

THE construction of an Integrated Radio-teletype and C.W. Operation Automated unit (fondly shortened to IRCOA) culminated a wishful dream of several years. For those interested in RTTY and c.w., this unit can provide an almost completely automatically operated station. For work in either RTTY or c.w. contest competition, the use of this unit permits minimum manual operation.

The automated unit has been tested in contest work. A system trial run was initated for evaluation purposes during the first World-Wide RTTY Sweepstakes and the CW Sweepstakes. Primarily, the system permitted an approach with a leisurely view. Its use allowed more operator "free time" and removed the tension associated with the continual pressing demands of contest work. In fact, there was time to keep a neat log, fill the pipe, get up and stretch, *etc.*, while the unit was doing the work. I selected the sequence desired and pushed a button to start a forward spill of stored information toward the transmitter keying circuit.

System automatic sending functions are performed by pre-recording the desired information and making this information available by manual switch selection. After selection, the stored information is released by pushing a button. The information is fed into the station transmitter and when it has been expended the system cuts over to manual operation for c.w. or RTTY keyboard manual inserts. There are no switches to operate to mute the receiver or to turn the transmitter on or off. When c.w. operation is desired the receiver protection and antenna changeover take place automatically upon transmitting with manual or automatic sendir The transmit-receive switching is done by opera ing one pushbutton located near the teletyp writer keyboard.

The automated unit, as presently used at th station for RTTY and c.w., has not been d veloped or sophisticated beyond surface fun tions. It will be recognized that the basic requir ments for full system performance has been a tained and that the maximum advantages of t system can be realized by use of interconnecte switching and programming circuits.

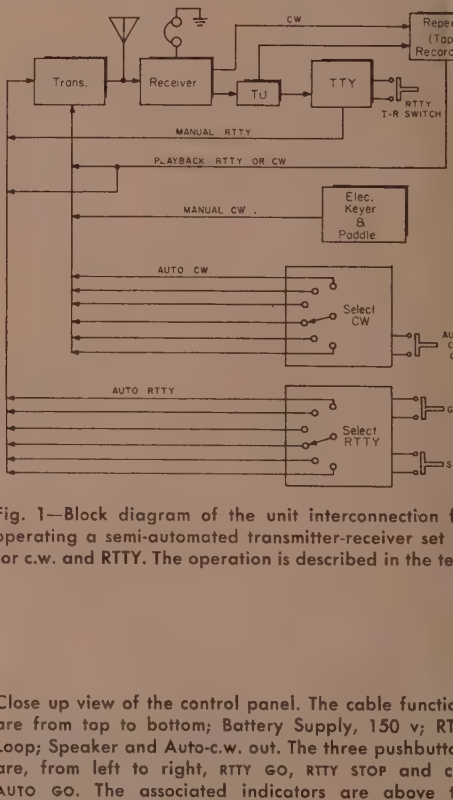
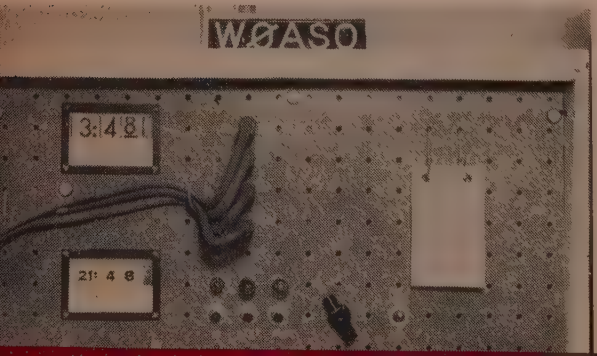


Fig. 1—Block diagram of the unit interconnection operating a semi-automated transmitter-receiver set for c.w. and RTTY. The operation is described in the te

*3071 South 44th Street, Omaha 5, Nebraska.



Close up view of the control panel. The cable functio are from top to bottom; Battery Supply, 150 v; RT Loop; Speaker and Auto-c.w. out. The three pushbutto are, from left to right, RTTY GO, RTTY STOP and c AUTO GO. The associated indicators are above t switches. To the right of the pushbutton switches is t selector switch, followed by the toggle which sele c.w. Channel 1 or 2. The card notes the informati content of the tapes.

Figure 1 shows, by block diagram, the permanently connected units and the entire basic system as it presently exists.

System Operation

To illustrate how the system works in actual operation for c.w., the following was available for use during the ARRL sweepstakes contest (pre-recorded, stored information): 1) Long CQ, 30 seconds. 2) Short CQ, 15 seconds. 3) CK 599 section and date and BK. 4) CK 589 section and date and BK. 5) CK 579 section and date and BK. 6) CK 469 section and date and BK.

The preceding c.w. information, including manual inserts, is released as follows:

1. Select the stored information sequence desired.
2. Push a button located on the electronic keyer paddle base to release the information.
3. Information is released to key the transmitter, antenna changes to transmit, receiver gain is reduced to permit monitoring, or muted with an audio tone inserted for monitoring.
4. After the released sequence has completed, stop is automatic to permit insertion of information on a manual basis.
5. After completion of automatic and/or manual operation the receiver returns to normal for listening.

Typical operation in the CW Sweepstakes contest as follows: (The bold portions indicate manual inserts with the electronic keyer adjusted to the speed of the automatic sending.)

CQ CQ SS SS CQ CQ SS SS DE WØASO WØASO CQ CQ SS SS CQ CQ SS SS DE WØASO WØASO BK
BK W7XYZ NR 37 WØASO CK 599 NEBRASKA **2134** NOV 12 BK

Briefly mentioned earlier, when RTTY is used there are no switches to operate to change from receive to transmit. A strategically located push-button, mounted near the tele-typewriter keyboard, labeled TRANSMIT-RECEIVE, ties in with the circuitry to enable fast transition from transmit to receive. Aside from contest work and net operation which may demand snappy transmit-receive operation, the use of a push-button is justly describable as handy.

Typical operation in the RTTY Sweepstakes contest was as follows

(The bold portions indicate manual keyboard inserts):

CQ CQ CQ CQ CQ CQ CQ WORLD WIDE RTTY SS CONTEST CQ CQ CQ CQ CQ CQ CQ CQ CQ WORLD WIDE RTTY SS CONTEST CQ CQ CQ CQ CQ CQ CQ CQ CQ DE WØASO WØASO NEBRASKA K K K K K
followed by automatic c.w. identification)
W7XYZ DE WØASO WØASO RETURNING RETURNING WØASO NEBRASKA SECTION RETURNING DE WØASO RETURNING. THANKS FOR THE CALL OM. I HAVE A MESSAGE FOR YOU. NUMBER **37 CK 599 2134** NEBRASKA SECTION. DE WØASO WØASO BK BK .....
W7XYZ DE WØASO WØASO NEBRASKA SECTION. QSL QSL. THANK YOU FOR THE MESSAGE. NAME HERE IS CHARLIE. HOPE TO HAVE A LONGER CONTACT WITH YOU SOON. GOOD LUCK IN THE RTTY SWEEPSTAKES 73 73. DE WØASO SK SK SK SK .....
followed by a CQ tape or QRZ tape, *etc.*)

Overall view of the station. The printer is on the left of the rack containing the transmitter and TU. The control panel for semi-automatic operation is on the left end of the operating desk. The multi-gate units are racked up to the right of the desk.

TD and Multi-Gate Units

A number of teletypewriter devices commonly referred to as transmitter-distributors have been designed for the purpose of accepting and transmitting information pre-recorded in digital form on a perforated paper tape. I made use of a device known as a "multi-gate". It performs similarly to a T-D, however it does not have distributor rings or brushes. The timed teletypewriter pulses are obtained by mechanical cam means that open and close the pulse contacts. Each multigate unit has three gates or tape heads which accept the standard teletypewriter perforated tape. Any one of the three gates in a unit may be selected to pull through the preloaded information tapes. Electromagnetic clutch operation engages the selected gate mechanism to the motor main shaft.

One multi-gate unit was modified for c.w. operation, two track, making available a total of six c.w. channels. In c.w. operation, teletypewriter hole two is used for function purposes. When tape hole perforation two appears, circuit arrangements cause the tape to automatically stop. To start the tape it is necessary to push a button. Holes one and five are used for dot and dash combinations for c.w. channel one, and holes three and four are used for c.w. channel two. The multi-gate modified for c.w. runs at a teletypewriter speed of one hundred words per minute and the resulting c.w. speed is approximately thirty words a minute. Faster code speeds may be attained by using a governed motor. The channel one c.w. pre-recorded information tape is punched on a standard teletypewriter tape perforator by operating the letter "Z" for a dot and the letters "ET" for a dash. Spacing between characters is made by punching the "blank" key. The "line feed" key perforates hole two for function use.

Figure 2 is a simplified circuit of the multi-gate. Contacts one through five close whenever the appropriate hole appears in the tape. Tele-

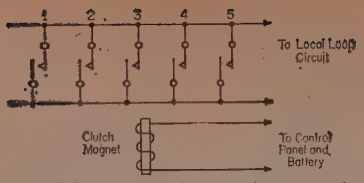


Fig. 2—Simplified circuit of the multi-gate unit as used for RTTY. Contacts 1 through 5 represent tape holes in a standard teletype tape. The clutch magnet engages the mechanism to the main motor to pull the tape through the head.

typewriter start and stop pulse contacts have not been shown for simplicity. The clutch solenoids, when energized by current, cause the tape to advance through the gate. One pair of wires is brought out to connect to the local loop circuit and another pair of wires to the solenoid current supply. Both connections are made through the select switch in the control panel.

Multi-Gate Modification

Figure 3 is the circuit of the multi-gate modified for c.w. Note that the set of lower parallel contacts have been split and separated into five isolated contacts. This is accomplished by removing the parallel contact block and substituting a fiber insulating board with separate contacts. The contacts used were small machine screw heads as shown in the photo of the modified contact board. The current in this circuit is small and the contact wear is low. Measured contact resistance is not as low as with the original assembly, however the resistance is low enough.

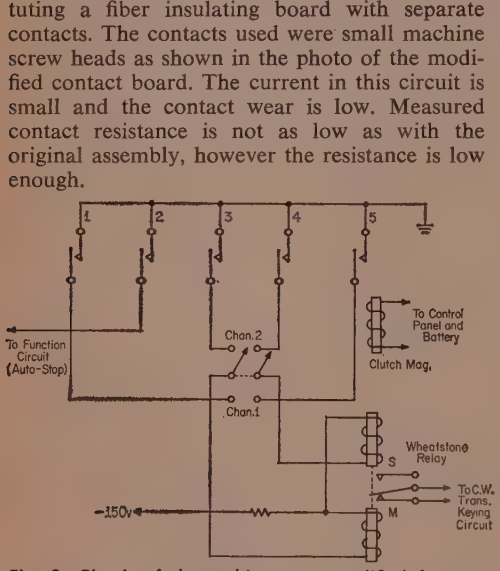


Fig. 3—Circuit of the multi-gate as modified for c.w. operation. The bottom leg of the contacts are split and are brought out as five separate connections.

The circuit makes use of a polar relay adjusted to magnetically hold the armature on either the mark or the space contact when the armature is displaced by hand, as a test of proper adjustment, or by passing current through the appropriate relay winding. Any of the common teletype polar relays can be adjusted to operate in this manner. Relays such as the 215, 255, or 209, have been used with equally good results. C.w. with almost perfect baud length and timing is produced. To make a dot, strike the letter "Z" on the keyboard which perforates tape holes one and five. We are assuming that information is to be recorded on channel one only. Assume hole one contacts, as shown in fig. 3, are momentarily operate. The relay armature is pulled to the mark contact, assuming it was on the space contact. It is held on mark magnetically until the cam operates hole five contact which causes current to flow momentarily in the opposite winding of the polar relay. This moves the relay armature to the space contact. A dash is made by striking the letters "ET" on the keyboard which perforates hole one and then hole five after the tape has advanced one step.

In operation, assume that the contact associated with hole one, the letter "E", is momentarily closed. A spurt of current moves the relay armature to the mark contact. The armature is held on the mark contact due to the magnetic holding action of the polar relay magnet. Holes two through four contacts remain inoperative since these holes are not connected to the polar relay when channel one is used. The relay armature continues to remain on the mark contact. The tape advances and holes one through four pass without making contact. The relay armature is still held to the mark contact. Then perforated hole five appears and momentary contact is made causing a spurt of current to pass through the reverse winding of the polar relay pulling the armature over to the space contact. The dash sequence is now complete. In this manner the dots and dashes are formed. Space between characters is made by punching the "blank" key. In the multi-gate modified for c.w. operation, each of the three gate circuit contacts are wired in multiple to reduce the number of wires in the control cable. Each of the three clutch solenoids are individually wired to the gate selection switch on the control panel. The d.p.d.t. switch on the control panel selects c.w. channel one (holes one and five) or c.w. channel two (holes three and four).

Hole two connects to the automatic stop relay circuit. During tape preparation, the spill of information may be stopped at a predetermined time, usually at the end of a sequence, by striking the LINE FEED key on the keyboard which perforates hole two.

Auto-Stop

The circuit shown in fig. 4 illustrates the auto

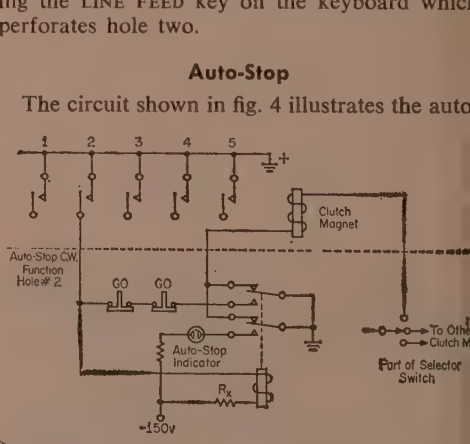


Fig. 4—Circuit of the Auto-Stop feature for c.w. operation. The operation is discussed in the text.

stop feature which is useful for c.w. only. It is a simple relay circuit designed to lock up through its own contacts. Once hole two contact closes momentarily the relay winding is returned to ground and the armature pulls up and locks. The operated relay contacts break the current path to the clutch solenoid and the tape stops instantly. Two normally closed push buttons, one located on the electronic key paddle base and the other on the control panel, connect ground to the top of the relay winding through the relay contact and the armature. To start the tape moving again it is necessary to depress one of the normally closed push buttons. This opens the current path to the relay causing the armature to drop back and complete the circuit to operate the clutch solenoid. To prevent lost motion, the automatic start push button is mounted on the paddle base for finger tip operation.

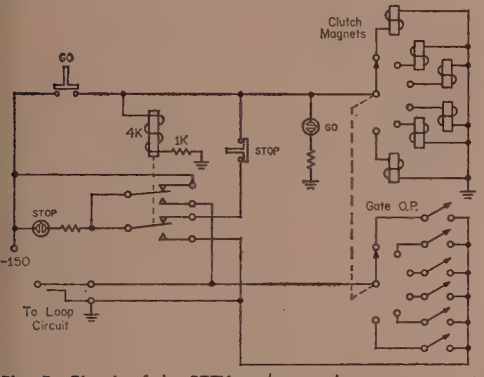


Fig. 5—Circuit of the RTTY GO/STOP relay arrangement, and the channel selector switch.

RTTY

The circuit of fig. 5 shows another relay setup that permits the use of pushbuttons instead of a lever switch and is primarily used for RTTY operation. It may also be used for the c.w. sequence to stop a continuous loop of tape that has not been conditioned for auto-stop. The relay circuit simply locks itself up through its own contacts and opens and closes the current path

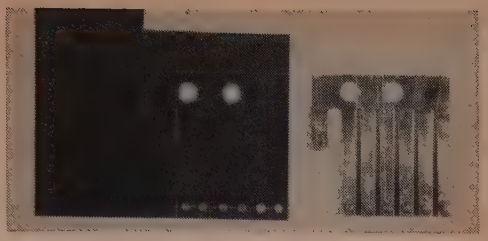


Photo shows how the multi-gate contact strip is modified for c.w. operation. The insulating board is the same thickness as the original contact strip.

to the clutch solenoids. In addition, extra contacts on the relay short the gate outputs to maintain a closed local loop when the RTTY information tapes are idle.

Figure 6 shows the tie-in between the electronic keyer (c.w.) the auto c.w. sending, receiver muting, and antenna change over arrangement, *etc.* The mercury wetted contact relay, used as the keying relay in the TO electronic keyer, has extra contacts that can be used to good advantage for break-in use. It will be noted that the "extra" contact is extended to a relay circuit in the receiver. It is also of the mercury wetted contact variety. Bridged across the TUNE switch terminals in the electronic keyer is a jack labeled AUTO C.W. Automatic c.w. from the modified multi-gate is fed into the TO keyer which operates the internal relay. The relay in the keyer operates from either manual or automatic c.w. operation. The relay in the receiver is energized immediately upon the first dot or dash, opening the manual gain control in the receiver and substituting an additional variable manual gain control to reduce the receiver gain to monitor level, shorting out the receiver antenna terminals and/or closing the antenna changeover relay. The first closure of the relay in the electronic keyer also causes the capacitor, which is bridged across the relay in the receiver, to charge. The capacitor is large enough to hold the relay in between the dot and dash sequence. The relay hang circuit is adjusted by the 15K potentiometer

[*Continued on page 92*]

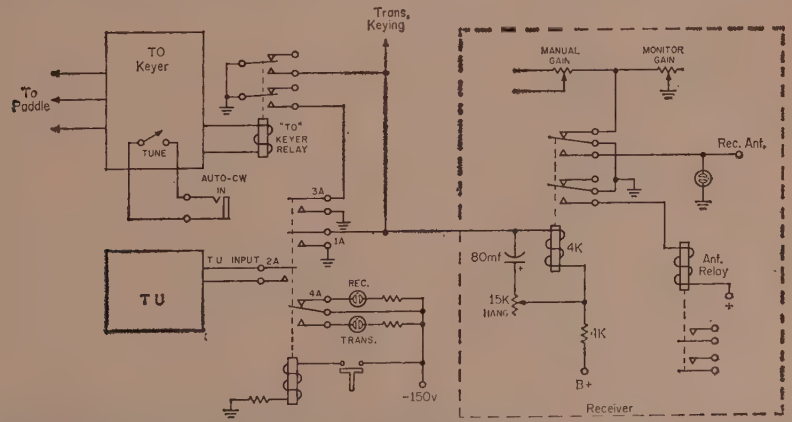
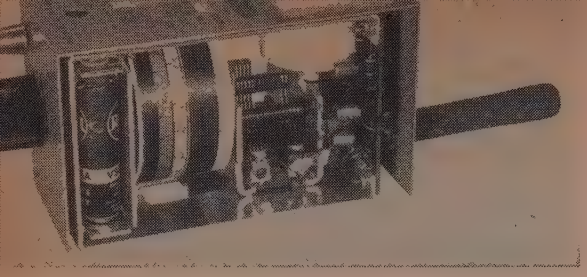


Fig. 6—Circuit showing the tie-in between the electronic keyer, auto c.w. sending, receiver muting, antenna changeover and RTTY operation.



Interior view of the Tunnel Dipper. The battery is mounted in a holder at the left of the dial drum, and the dual-section tuning capacitor is at the right of the dial. A single capacitor section is used for the two highest-frequency ranges. Both sections are automatically switched in when the lower-frequency inductors are used. The printed-circuit board, at the right of the tuning capacitor, is mounted vertically at the end of the sub-chassis framework. The three transistors are in horizontal position protruding from the left of the circuit board. The tunnel diode is hidden from view. The dial window and the meter are on the top of the instrument, an inductor is plugged in at the right, and the tuning knob, with the sensitivity control above it, is at the left.

CQ Reviews:

The Heathkit HM-10A Tunnel Dipper

BY WILFRED M. SCHERER,* W2AEF

A LITTLE over a dozen years ago *CQ* published a number of articles describing the construction and applications of the grid-dip oscillator[1]. In a very short time thereafter, the popularity of this device rose fantastically and it is now one of the most widely used instruments in the electronic field.

During recent years semiconductors have become a practicality and today, transistors and tunnel diodes are replacing vacuum tubes in many types of equipment. One such modernization, made to the grid dipper, is now available with the advent of the Heathkit Model HM-10A Tunnel Dipper.

Circuit

This instrument employs a tunnel diode, two crystal-type diodes and three transistors. The tunnel diode is used for the dipper's oscillator. One of the crystal diodes is coupled to the oscillator tank and rectifies the r.f., the d.c. being applied to a sensitive d.c. amplifier consisting of the three transistors, while this amplifier, in turn, activates a milliammeter. Thus, any decrease of r.f. energy in the oscillator tank, such as occurs when power is absorbed from it at the time it is coupled to a resonant circuit, will cause a decrease, or dip in the meter reading. The second crystal diode is silicon which provides a constant voltage source for one of the transistors. The unit is powered by a self-contained 1.5-volt penlite battery. Current drain is 5 ma.

When the HM-10A is used as a non-oscillating detector (absorption-type wavemeter), the tunnel diode is switched out of the circuit, leaving only the crystal diode rectifier, its amplifier and the meter in operation. This arrangement eliminates heavy loading and lowering of the *Q* of the tuned circuit by the tunnel diode. The crystal diode is so lightly coupled to the tank circuit (by 3.3 mmf), that the *Q* is virtually unaffected resulting in sharp frequency indications.

Besides being modernized with up-to-date solid-state circuitry, the Tunnel Dipper provides advantages over vacuum-tube type grid dippers. Self-contained battery operation enhances its portability together with the elimination of the inconvenience of an external-power cord.

The high-*Q* circuitry makes it possible to differentiate between signals of closely related frequencies. The exceptionally high sensitivity of the metering circuit makes the instrument invaluable as an aid for tuning up transistorized r.f. oscillators and amplifiers, and for checking harmonic radiation and parasitic oscillations from other types of equipment. It also makes an excellent field-strength meter.

The oscillator power is very low, so when the unit is used as a signal generator, the possibility of receiver overload is minimized.

Assembly

The HM-10A is attractively designed and its sturdy construction, together with its rugged case of $\frac{3}{32}$" metal is a gratifying revelation. The size, including the cover of the case, is 5⅞" long × 2$\frac{13}{16}$" wide × 4$\frac{3}{16}$" high.

The pre-assembled plug-in inductors are likewise ruggedly made and a heavy, hard enamel-like coating for electrical stability and for protection against damage. Each inductor has a phono-type plug and is color-coded to match

[*Continued on page 92*]

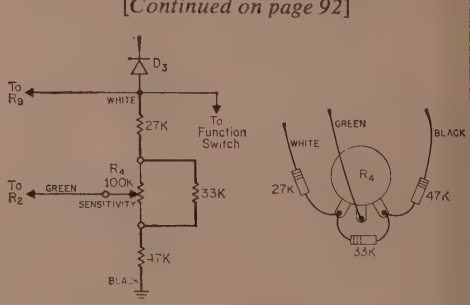


Fig. 1—Circuit and pictorial diagram illustrating the addition of three ½ watt resistors (bold) enabling smoother SENSITIVITY control.

*100 East Palisades Ave., Englewood, N. J.

[1]Scherer, W. M., "The Dipper," *CQ*, May, 1947.
Scherer, W. M., "Applications of the Grid Dip Oscillator," *CQ*, Jan., 1949.
Scherer, W. M., "The Improved Dipper," *CQ*, Feb., 1949.

Reviewing The Radio Classics

Crystal Filters For C.W. Reception

BY DAVID T. GEISER*, WA2ANU

Number 2 of a Series

Few receivers today appear complete without a crystal filter for c.w. use. The fundamental theory behind their operation is given in the following discussion.

LAMB first gave how-to-do-it descriptions of crystal filters for amateur receiving use.[1]

The idea of crystal filters was not new at the me, but many amateurs were having difficulty aking crystals even oscillate and certainly the ea of crystal filtering was new to amateur actice.

Crystals appear as a series *RLC* circuit shunted holder capacitance. The effective series inctance of a crystal is so high and series caacitance so low that the crystal looks like the older capacitance alone until the series resonant "short circuit") frequency is very closely approached.

Most basically, the crystal filter consists of the ceiver first-stage i.f. amplifier driving a transrmer having push-pull output, with grounded nter-tap (Fig. 1). One side of the push-pull ansformer feeds the second i.f. amplifier rough the crystal; the other side feeds the me point through a small variable capacitor . When the incoming i.f. signal has a frequency kc or so from the resonant frequency of the ystal, the two signals reaching the second i.f. nplifier are almost exactly equal but of opposite olarity, and almost completely cancel out the coming frequency. If, however, the incoming gnal is exactly on the crystal resonant freuency, the crystal looks like a short circuit and lows much more signal to pass to the amplifier rough it than through the variable capacitor. ood crystals thus permit narrowing the effecve bandwidth of a receiver to a few dozen cles.

Lamb, in his original article, terminated the ter in resistance and some stray capacitance. he stray capacitance "fortunately" made the iginal circuit work (a pure high resistance eing undesirable), but an inductive termination creased output "35%."

Lamb called C_2 the "selectivity" control and the "phasing" control, and these names still ppear on the crystal filters today, though selecvity may be varied in many ways.

One problem Lamb faced in design was the problem of multiple responses in crystals. Few even today realize that all mechanical resonator systems, including not only crystals but also the Collins and other mechanical filters have spurious responses. Good devices have these responses far enough from the normal operating frequency so that ordinary i.f. transformers or other tuned circuits will successfully attenuate unwanted signals falling at these responses. For this reason, nowadays, it is profitable to specify that crystals intended for crystal filter use have no unwanted responses within a particular pass-band.

The original article described the "Single-Signal Superhet," and many newcomers hearing the name mentioned ask how it was possible even then to receive just one signal at a time. Occasionally then, the uncrowded (relatively) bands *did* permit reception of one signal at a time, but the true meaning of the name seems to have been that in tuning across the band you heard each signal effectively only once. This cut the QRM in half, but by no means eliminated all competition.

Adjustment for the single-signal reception was achieved by (1) peaking all controls with selectivity high on a stable incoming signal, (2) adjusting the b.f.o. for about a 1 kc beat note, (3) swinging the main tuning dial to the other side of zero beat, (4) adjusting the phasing control to minimize the output, and (5) checking for spurious responses. The last step is unnecessary today if a reasonable number of good i.f. transformers and a good filter crystal are used.

(Author's note: The crystal filter for 25 years was the difference between a "fair" and a "good" receiver. Even today it is hard to beat for c.w. reception. The main requirement for its successful use is a stable receiver front end.) ■

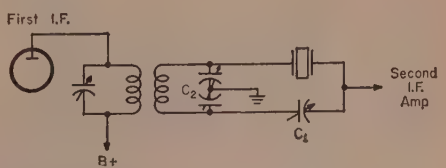


Fig. 1—Basic crystal filter. The impedance of the second i.f. amplifier is critical for proper operation.

ight Military Electronics Dept., General Electric Co. Utica, N. Y.

amb, J. J., *QST*, Aug., 1932; Mar., 1933.

A "G-Line" For U.H.F.

A Commercially Available Transmission Line of Extremely Low Loss

BY FREDERICK W. BROWN*, W6HPH

One handicap faced by the u.h.f. experimenter is increased transmission line loss at the higher frequencies. For any type of line except waveguide, the loss per unit length always increases with increasing frequency. For example, if we use only 30 feet of RG-8/U at 1296 mc, the loss will be 3 db, meaning that one-half of our precious transmitter output is wasted in heating up the coax. Twinlead is somewhat better and open-wire line is still better, but neither of these is completely immune to weather effects.

There is now on the market a transmission line that should have great appeal to the amateur who requires a long run at 1296 mc. This is the Surface Conduction, Inc. Model TVL-01 "G-Line" designed for u.h.f. TV use. It is available from Surface Conduction, Inc., 1501 Broadway, N. Y. 36, N. Y. and sells for $48.75 list price and includes 150 feet of wire.†

"G-Line" is named for its discoverer, Dr. Georg Goubau who first explained the principle in 1950.[1] A short article also appeared in *CQ*.[2] The transmission line consists of a single conductor coated with a dielectric material. By means of a conical horn (called a launcher) at one end, it is possible to launch a non-radiating wave that clings to the wire. The power is propagated not in the wire, but in the region around it. At the termination end, an identical horn (sometimes called a receiver) "catches" the wave and delivers the r.f. energy to the load. Since very little power is lost in the dielectric material or in the metallic wire, the total loss per foot is much smaller than practically any conventional type of transmission line. The cost per unit length is also potentially lower than any competitive line[3]. S fig. 1.

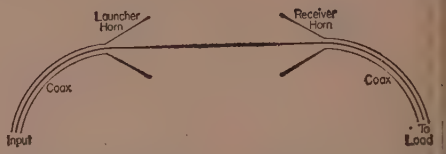


Fig. 1—The complete "G-line" setup, shown here cross-section, consists of a "launcher" and "receive horn connected by a dielectric-covered wire. Since t two horns are identical energy may be propagated either direction.

These advantages, however, do not stand alo without compensating disadvantages. For o thing, since the energy is propagated in the regio around the wire, G-Line must be kept at lea one wavelength from any other object. This hol not just for lossy objects, since anything that di turbs the field will cause radiation losses fro the line.

Another disadvantage is the requirement f smoothness. Even a bend in the line is enoug discontinuity to cause radiation losses. Ben with a large radius of curvature (at least tw wavelengths) are permissable however, and eve abrupt bends of less than 30° are not seriou Nylon fish-line may be used at a bend or poi of support. Figure 2 shows how to make a be of large curvature.

Results

A sample Model TVL-01 "G-Line" was teste at W6HPH on both 432 and 1296 mc. The k comes complete with two launcher horns and 1 feet of dielectric covered wire[4]. The line itse is #14 hard drawn copper covered with 0.06

*Star Route, Idyllwild, Calif.

†It should be stressed that the price of the commercially available G-Line becomes more competitive as the transmission-line length increases. At shorter lengths, however, (below about 60 feet) low-loss coaxial cables will do just as well.—*Ed.*

[1]Goubau, G., "Surface Waves and Their Application," *Journal of Applied Physics*, Nov., 1950, p. 1119.

[2]White, W. W. Jr., "The G-String," *CQ*, April, 1953, p. 13.

[3]More theory can be found in an article written by Ha ner, T., "Microwave by Wire," *Electrical Engineerin* March, 1959, Dr. Hafner is President of Surface Condu tion, Inc., N. Y., N. Y.—*Ed.*

[4]The wire is also available in reels 500 feet long for $36. amateur net.

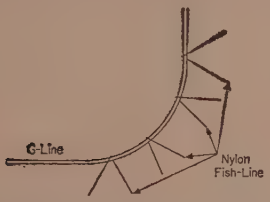
Receiving end of the TVL-01 "G-Line," set up for t purposes.

nput end of the launcher. The plastic sleeve has been ulled back to show how the balun was modified for 296 mc operation. A short, placed just left of the alun's center, is soldered between the center conductor and the outside frame.

f brown polyethylene dielectric. Each horn is ¼" diameter at the mouth and about 17" long. he cones are made of spun aluminum and the nouth is covered with a sheet of fiberglass to eep out the weather and maintain the centering f the wire.

A balun, housed in a plastic sleeve, is used at he throat end of each horn to convert the un- alanced horn input to 300 ohm twinlead. See hoto.

For test purposes, a total length of nearly 150



ig. 2—Sketch showing how a large radius bend can be ade in a "G-Line" by supporting it with nylon fish-line.

eet of G-Line was stretched horizontally be- ween the base of the station tower and a distant ree trunk. No supports were used on the line tself and it was everywhere maintained at least wo feet from the ground or any other object. he balun output at the far end was terminated vith a 300 ohm dummy load.

Since the TVL-01 was designed to cover a requency range of 470 to 890 mc, we expected n unmodified unit to give fair performance at 32 mc. Results, however, were disappointing. lthough the input s.w.r. was only 1.5, the total oss for the 150 foot length was greater than 6 b. An effort was made to increase the horn size y clamping sheet aluminum extensions on each one, and although this increased the mouth iameter to about 14 inches, the high attenua- ion was still present. Accordingly, further meas- rements at 432 mc were abandoned.

It was at 1296 mc that the G-Line gave out- tanding performance. The input and output aluns had to be modified however. These quar- er wave baluns were evidently designed for some requency near the geometric mean of 470 and 90 mc (about 646 mc); the result being they ook almost exactly like a half wavelength at 296 mc. This was verified by a measurement n the input twinlead, revealing an s.w.r. of reater than 5 at 1296 mc.

Each balun is modified by soldering a short between the center conductor and the outside frame. The short is a strip of sheet copper about 5/16 inch wide and 1¾ inch long. It is positioned 1¾ inches behind the white insulator near the vertex of the horn (see photo). The strip is soldered to the brass center conductor and both sides of the steel frame but must not touch the other two brass conductors that extend out the back to provide twin lead terminals.

With the modified baluns, the s.w.r. was again measured and found to be a very low 1.2:1. The overall loss at 1296 mc through 150 feet of line measured from the twinlead terminals on the launcher to the identical terminals on the receiver was just 1 db. Try to do *that* with RG-8/U!

To test the effect of wet weather, the entire line was thoroughly soaked with a sponge and the measurement repeated. No measurable increase in attenuation over a dry line resulted.

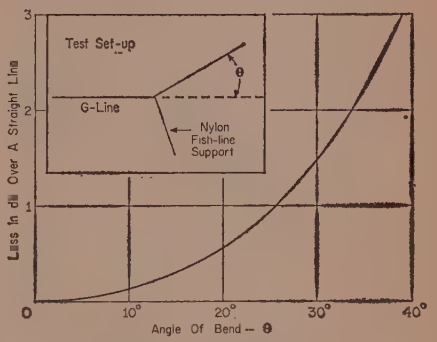


Fig. 3—Curve showing the measured loss at 1296 mc resulting from a bend in the line.

Some experiments were made with bends in the line to determine what effect they would have on attenuation. Results are shown in fig. 3. Even though the bend was supported at only one point, it was not perfectly sharp, having a small radius of curvature due to the natural stiffness of the hard drawn copper wire.

In conclusion, G-Line is recommended for u.h.f. use wherever long runs are required and it is possible to keep the line clear of any other objects. Specifically, the relatively inexpensive model TVL-01, if modified according to the above directions will give excellent performance at 1296 mc. ■

St. Pierre OR BUST!

BY HAL SMITH*, W2GKE/FP8BM

This is the concluding episode of the DXpedition to St. Pierre, highlighting some of the operating procedures, sightseeing and social life found on this small French possession. If you're contemplating the trip this information will be well worth the reading time involved.

Part II (Conclusion)

AFTER lunch we carried our gear up to the third floor of the hotel and started to unpack. We put our luggage in the bedroom next to room 8 which is the traditional operating room for all DXpedition stations that operate on St. Pierre. Room 8 is a fairly large room having two cots and a sink. The operating table is as large as an office desk and held all our equipment with plenty of elbow room.

We decided to call Gus Roblot, FP8AP, for information on obtaining our licenses. He informed us that he would get to work on it at once and would come down later in the day, to visit us. It was decided that the best thing to do was to put up our antennas before it got dark and set up our equipment at the operating position. We took our antenna equipment into the yard and searched out Monsieur Robert to obtain his permission to install antennas on the roof. He said that he could not allow us to go on the roof and this was probably due to the fact that buildings of St. Pierre are in need of many repairs. Very few buildings on the island are even painted. However, after this momentary setback, it was decided that we would adapt ourselves to the situation as it existed. After all, we had plenty of experience installing antennas under adverse conditions during field day and this situation was quite similar.

We went out into the yard and found that most of the area was occupied by huge piles of old lumber and other materials. At least, we could be sure of obtaining lumber for antenna masts. The Mosley Tri-band whip with its four sixteen foot radials was mounted on two pieces of old 2×4 nailed against the fence and guyed with plastic washline. This enabled us to get our vertical ground plane antenna up a quarter wave above ground, and feed it with 90 feet of RG-8/U coax cable. This antenna was used for operating on 10, 15 and 20 meters and it performed very satisfactorily.

Now to install the antenna for 40 meter operation. We had brought along a vertical ground plane antenna which was made from surplus whip sections mounted on a base and equipped with 33 foot radials. As you might know, these whip sections sway in the breeze during installation and in view of the lack of manpower and the condition of the yard we decided against using this antenna. It would have been difficult to guy the antenna as we could not drive stakes into the ground because of the abundance of scrap lumber lying all over the yard.

We previously prepared for such an emergency by simply using two of the radials as a coax doublet fed with a 100 foot piece of RG-59/U coax. The 40 meter doublet was installed from the window sill of our next door bedroom to the building across the yard. It was found that someone had previously installed a wash line hook at the roof edge of this building.

An old ladder was located and Dave held it up vertically against the building while I stood on the top rung and threw a piece of plastic clothes line over the hook. Ed was observing "operation skyhook" from the room 8 window and still praying when I reached *terra firma*. One end of the doublet was tied

The FP8BM shack with Ed Borow, K2OQA at the controls.

*26 Linden Street, Bayonne, New Jersey

to the plastic line and the antenna hoisted into position. An 80 meter antenna was not installed at this time as we wanted to check band conditions prior to installation.

With the antenna situation all cleared up, we gathered up our tools and headed back to room 8. Ed had been setting up the equipment in the meantime and we were now all set to go. Incidentally, it is well to mention at this point, that the wiring in the hotel is not a BX cable job and there are no outlets. The wires just come out of a hole drilled in the ceiling and connect to an ordinary lamp socket. One must bring along a female lamp socket with attached outlet taps so that an extension cord can be plugged into the socket and run over to the operating position. The socket was found to be defective so it was removed and we connected our extension cord to the line until we bought a new socket. A desk lamp was used, as the overhead lamp would be too bright while we were taking shifts at the operating position. We decided against using the available bedroom to avoid making too much noise in the hallway. One operator would be on duty while the other two operators could take a nap on the two beds in the operating room. The entire station installation time took us about 3 hours and the experience we had on many past field days really paid off.

Final Clearance

Just as the final checks on the equipment were being made we were honored by a visit from Gus Roblot, FP8AP, and his friend René Enguehard who is connected with the islands Treasury Department. This was our first personal meeting with Gus, although we felt that we already knew him, from contacting him on the air and through his letters. He expressed deep regret that we could not go on the air officially at once but supplied us with a list of our probable call letters. We told him we would wait until morning as we were satisfied with our progress, since we landed only a few hours ago and already had our station completely set up.

Gus informed us that the previous radio inspector, Louis Hourtoné, had been transferred back to France and that the new radio inspector, Monsieur Guillemin, was not available at the moment and therefore our official licensing would be held up until morning.

Gus had arranged a meeting with Joe Ortiz, who worked at the wireless station, at 8:30 A.M. the following day, for the purpose of obtaining our licenses. In the meantime, Gus took us down to his 36 foot cabin cruiser *Atta Boy* and invited us to celebrate with him our arrival on the island. We were later to spend many enjoyable hours on the *Atta Boy* which was the official meeting place for all of Gus' friends.

Anxiously waiting to fire up the rig, we were up bright and early the next morning, went down to the wireless station and met Mr. Joe Ortiz who, in the absence of Monsieur Guilleman, was officially empowered to license us.

We were verbally assigned individual calls with Ed being assigned FP8BL, Dave FP8BN and myself FP8BM. Joe explained that he would visit us later in the day and bring the necessary forms for us to fill out. The licenses would then be sent to the governor of the island for his signature and would be returned to us in two days. However, in the mean time we were given permission to start operating immediately and informed Joe that we would use the call FP8BM for our DXpedition operation. The license fee is 500 francs ($2.00) and the license is good for a lifetime. Once you are issued a license you can start operating immediately upon arrival if you decide to go on another trip to the island. All you would have to do in this case is to notify the authorities that you are going to operate and inform them of your call.

Operating Frequencies

Gus Roblot had previously supplied us with a list of the operating frequencies and input powers which are permitted in FP8 land.

The frequencies are as follows:

3.5— 4.0 mc	144.0— 146.0 mc
7.0— 7.2 mc	420 — 460 mc
14.0—14.35 mc	1215 —1300 mc
21.0—21.45 mc	2300 —2450 mc
28.0—29.70 mc	5650 —5850 mc
72.0—72.8 mc	10,000—10,500 mc

One is allowed 50 watts input on the 3.5 and 7 mc bands and 100 watts input on all other frequencies. Phone operation is permitted on the frequencies outside the American phone bands but it is advisable to check with the authorities before using these frequencies.

We had previously decided that each operator would work 29 stations, which fills one page of the ARRL logbook, and then turn the rig over to the next operator in turn. This procedure worked very well and it helped to reduce operator fatigue caused by the terrific QRM in the pileups.

Pileups

Having obtained official permission to operate, we rushed back to the hotel and fired up the rig. All of us had a grin on our faces as we contemplated what it would be like facing the expected pileups. Ed chose a comparatively clear frequency in the 20 meter band, pushed the weights on the Vibroplex forward and called our first CQ. The first station to reply was W3KID.

After several more QSO's a huge pileup was created on the frequency and from then on we had no difficulty in obtaining QSO's. Once everyone knew we were on the frequency it did not take too long to create a pileup no matter where we operated.

Other firsts in the district QSO's included W1APY, W2AEB, K4JVE, W5CEC, W6KEV, W7DJY, W8KVT, W9YSX and WØRSZ. First to be worked on the other continents were DL5AF, FA8TT, PY5LJ, ZL1HY and MP4BCV. The latter contact was made through the help of W9FJY, who advised us that MP4BCV was calling us many times. We asked the gang to QRX on the frequency and were successful in raising him even though he was RST 349 and FP8BM was his first St. Pierre QSO.

We were advised by K5KBH that many VK's were calling us but they were not heard although several ZL stations were worked. Of course, we worked Gus Roblot, FP8AP on both phone and c.w. and Michel, VE2AFI who was operating as FP8BO. Another contact was made with WØDIB who wrote us several letters before our departure stating that he never worked FP8 land even though he had worked 168 countries. One night, after one of our CQ's who should come back to us but Tom, WØDIB! You would have thought that we just had made WAZ judging by the yells emitted by all three of us.

It was found that the 20 meter band was best with the 40 meter band second best. Many times, while operating on 20, we had requests to QSY to 40 meters. On many of these occasions, when we did comply with these requests, the 40 meter band did not yield as many contacts as the 20 meter band had and we were forced to QSY back to 20 meters. Not a single station was heard on 10 meters and no operating was done on the 80 meter band due to the fact that every time the band was spot checked there were only a few stations coming through. We had poor results on the 15 meter band, working only 35 stations. Many requests were received to go on all bands from 10 to 160 meters and use c.w., a.m. and s.s.b.

In addition, many operators thought they understood the current conditions on the various bands at St. Pierre better than we did, and tried to steer us from one band to another. Conditions on phone were poor, so very little phone operation was done. The only phone contact on 15 meters was with K1IVT. The only QSO's on 20 meter phone were W1QCO, K2LHV, W3BTR, W3LJZ, WØGKL, VE8TO, G3NES, GW3HXX, HK3LX, IM1RIF in addition to FP8AP and FP8BO.

On several occasions the W gang was asked to QRX while we called CQ DX. Excellent cooperation was obtained and we were answered by many DX stations who said that we were their first FP8 QSO. We did not make a practice of doing this however and decided to work stations as they came. However, there can almost be no doubt that if we had concentrated on DX only, we could have made DXCC which was one of our goals in addition to WAS and WAC. For the most part we obtained good cooperation from the W stations when contacts with home stations in Bayonne and Hazlet, N.J. were made.

During each and every QSO it was announced twice to QSL via K2VZJ, Bill Grim, who had the honor of being QSL manager for FP8BM. All stations were asked to please QSL SASE. Apparently there are many operators that do not know that SASE means "self addressed stamped envelope." One chap, who holds an A1 operator certificate, addressed his card to "Bill Grim, K2VZJ, SASE" but there was no SASE inside the envelope. It might be well to point out that some stations sent extra stamps for our use in answering those fellows who did not send postage. We tip our hat to those thoughtful lads. We wish to emphasize that in the future if you are lucky enough to work a DXpedition station please send return postage to the QSL manager as the postage cost is terrific.

As of this writing we have QSL'd all of the stations who sent SASE or IRC coupons. We are holding up cards awaiting an SASE from those stations that did not comply and Bill is only too glad to send every station a card and will QSL immediately on receipt of SASE. His mailman practically had a fit the first two weeks of delivering the mail and asked when the avalanche was going to end.

Another thing that we wish to comment on is the fact that many stations worked us as many as five times just to get another report. Since we went to St. Pierre for the sole purpose of giving as many stations as possible a chance to work a new country this procedure defeated our purpose due to duplicate QSO's. Possibly I could drive across this point more forcibly if I said that our cost to QSO each individual station was 55 cents per. I wish to add that in the future, if you are fortunate enough to work a DXpedition once, consider yourself lucky and give the other fellow a chance.

Social Activities

Of course, all our time on the island was not spent in operating FP8BM. We went to one of the Sunday dances with Gus and his XYL and while there met ex-FP8BX's daughter. We found out that when Paul Detchverry died, Gus explained this to every station that he worked and asked for any small donation to assist his family. Almost every station that Gus QSO'd sent in a donation and he turned the total amount over to Paul's family, in this, their hour of need. Pauls family is doing fine now and Gus might feel proud that he was able to contribute to a fine cause.

We attended the rifle matches where Gus won a handsaw and also saw a soccer game in which St. Lawrence defeated St. Pierre, 2-1.

Local Installations

Joe Ortiz escorted us around several of the transmitting and receiving stations on the island which are used for communication with Paris. Due to work schedules he was unable to show

us FPN, St. Pierre Radio, which broadcasts for a few hours each night on 1375 kc. These stations really have very fine equipment and some of the receivers were built like battleships. We wished that we could have taken one of these receivers home and bandspreaded it for amateur use.

Since it sometimes would be foggy for a couple of days we took advantage of fair weather and took one gross of pictures with the trusty Argus and, in addition, we shot eight rolls of Kodak color movie film. These films are available for showing to local radio clubs and the crew of FP8BM will be glad to show them to all clubs within the metropolitan area and give talks on our DXpedition to St. Pierre-Miquellon Islands.

XYLs

We have been asked by several hams as to whether or not they ought to bring their XYL's on such a trip. In answer to this question, I would say that there is not much they can do on the island other than take advantage of the many bargains in clothing, perfumes, liquors and jewelry. If you have enough money the XYL could have a ball as you can bring back $200 worth of goods including one bottle of liquor up to 40 ounces and one carton of cigarettes. Cigarettes cost two dollars a carton and there are many fine liquors available. Of course, you can take the XYL to any of the previously mentioned social activities when you are not operating.

The last QSO was with G3WP at 0738 GMT on August 10th. I wanted to keep the station on the air in order to reach the quota of 2000 QSO's, which was our goal. However, I was outvoted and it was decided to immediately start dismantling the station so that we would have ample time to make the return trip to W2 land. This decision proved to be sound as we were deluged with social invitations which occupied the entire last day on the island.

Fishing

We proceeded to pack all our equipment and had just about finished when Gus visited us and invited us to go cod fishing aboard the *Atta Boy*. We could not obtain any squid which is the best bait for cod and had to settle for capelon which is a small sardine like fish about six inches long. We went fishing for a couple of hours and Gus was quite surprised when I informed him that I had never been boat fishing before. Everytime we caught a fish Gus would propose a rum toast. I wound up as the undisputed fishing champ after having caught nine large codfish. Gus permitted me to pilot the *Atta Boy* back to port and I was glad that I had only taken a sip at each toast.

Our catch was strung on a wooden pole and carried back to the hotel. We offered our catch to Monsieur Robert who had the fish prepared for our evening meal.

The crew of FP8BM aboard the 36 foot cabin cruiser *Atta Boy* after a day of cod fishing. From l. to r, Dave Wagner, K2LSU/FP8BN; Ed Borow, K2OQA/FP8BL and Hal Smith, W2GKE/FP8BM.

After lunch, René Enguehard visited us and invited us on a sight seeing motor trip around the island. He took us to his home in Savoyard, which is located on the southwestern tip of the island.

Many summer homes are located here and the scenery is very beautiful. This was in direct contrast to the scenery in the town of St. Pierre. We were glad we went on this tour and were able to take in the scenic sights which was recorded on color film. We met René's family and enjoyed their hospitality. Rene and Gus seemed inseparable and many happy and enjoyable hours were spent with them.

Departure

We came back to the hotel, had supper, and went down to the Hotel Ille de France to make our reservations for the return flight leaving the following morning for Sydney.

Gus called at the hotel and invited us to his home that evening for a farewell get-together. We met his entire family and Madame Roblot served sandwiches and little French pastries which were delicious. The pastries were made from berries that Gus had picked on the island of Langlade earlier in the day. Gus had some trouble with his BC-348 receiver which we managed to clear up considering the lack of spare parts available. Both Gus and his XYL

[*Continued on page 83*]

Gus Roblot, FP8AP, the only active amateur on St. Pierre.

Taming The Diode Field Strength Meter

BY RUFUS P. TURNER*, K6AI

Field strength meter readings and on-the-air results often fail to jibe. Here is why, and what to do about it.

THE diode-type field strength meter is perhaps the simplest r.f. test instrument an amateur can build. Yet its use can cause confusion out of all proportion to the size and unsophistication of this instrument. A field strength meter is invaluable in the adjustment of antennas and transmitters, but for reliability it must give accurate and repeatable indications. Many users have not found this reliability in the home-made, diode-type meter: for example, the meter may show that a beam antenna has a 5:1 front-to-back ratio but on-the-air performance indicates a poorer figure. Such discrepancies may be explained, and there are ways of correcting them. We discuss them below with the hope that more users will get full dependability from the f. s. meter.

First, look at the typical circuit, fig. 1. When a signal is tuned in, the r.f. voltage (E) is rectified by CR_1 (which usually is an inexpensive, general-purpose germanium diode), and the resulting d.c. output current (I) deflects d.c. meter M (anything from a 0-1 d.c. milliammeter to a 0-50 d.c. microammeter). The user assumes that deflection of the meter is directly proportional to the signal strength and that the response is the same at all frequencies. Neither of these assumptions is valid. The gremlins in the picture are (1) nonlinear response of the diode, (2) rectification efficiency of the diode, (3) internal resistance of the meter, and (4) change in LC ratio of the tank as the instrument is tuned. Let us see how each of these operates, and performance of the f. s. meter will be better understood.

Nonlinear Response of Diode

At the relatively low signal levels involved in field strength measurements, d.c. output current, I, does not drop to half its original value when the r.m.s. input voltage, E, is halved. This means simply that the conduction curve of the diode is not linear at these signal levels. It does not begi to approximate linearity until the direct curre is in the neighborhood of 10 milliamperes.

Figure 2 shows measured voltage values co responding to deflections of a 0-100 d.c. micr ammeter in a field strength meter. Note here tha the half-scale deflection indicates 0.64 v inpu instead of the expected 0.525 v, and that one tenth-scale deflection (10 μa) indicates 0.2 rather than the expected 0.1 v. With a more sen sitive meter (such as 0-50, 0-20, or 0-10 micr amperes), the response is even more nonlinear.

From this it is evident that the regular scale o the meter cannot be used directly, except whe (for strictly comparative purposes) the *sam* deflection is used in each measurement—and thi is rarely the case. Thus, what would appear to b a discrimination ratio of 10 to 1 (100 μa to 1 μa), as shown by the meter in this illustration would actually be a ratio of only 5.25 to 1 (tha is, 1.05 v versus 0.2 v).

Where their conduction curves are concerned semiconductor diodes are individuals; you ca test dozens of diodes before you find two curve that match exactly. The response shown in fig. is for one particular 1N34A diode.

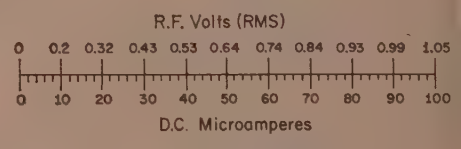


Fig. 2—A typical calibration chart showing r.f. voltag versus meter current. Note the non-linearity.

What does this all mean? Simply that you mus calibrate your f. s. meter individually, using a r.f. signal generator that has a calibrated micro volts output indicator. During calibration, yo may prepare either a chart or curve, or a specia card for the meter. If ever you replace the diod you must recalibrate.

Effect of Rectification Efficiency

The semiconductor diode is not as good a rec tifier at high frequencies as at low frequencies This is another way of saying that the rectifica tion efficiency (ratio of d.c. output to r.f. input decreases as the frequency increases. The eff ciency of a 1N34A diode measured by the autho varies from 85% in the standard broadcast ban

[*Continued on page 81*]

*122 East Mariposa Street, Altadena, California.

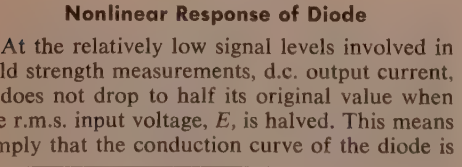


Fig. 1—Details of the diode field strength meter. Tank circuit L_2, C_1 should be selected to cover the desired frequency. Winding L_1 is 1 or 2 turns ⅛" from L_2.

V.H.F. Transistor Bargains

BY DON STONER*, W6TNS

The v.h.f. semiconductor field is now offering a number of interesting "buys" which make possible projects above 50 mc which were improbable a few years ago. All transistors listed sell for less than $5.00.

THESE days, everyone wants a bargain, but like the ole Greek philosopher said so long ago, "There ain't no free lunch." The semiconductor industry may prove to be the exception, however. This business has become so competitive that many devices are being made available at bargain prices.

The trend, of course, is to v.h.f. and it is the transistors which work at these frequencies which are so attractive to amateurs and experimenters.

The accompanying chart lists a group of bargain v.h.f. transistors. They all have two things in common; their price is below $5.00 (net, over the counter) and they have an alpha cutoff frequency above 50 mc. The prices given are the most accurate available at this time and were obtained from manufacturers price lists and various catalogs available to the author.

Several of the types listed are outstanding bargains and worthy of special mention. For example the 2N711, made by Motorola, Texas Instruments and others, is priced at only $1.80. This transistor has a dissipation of 300 milliwatts and should be quite useful in six and two meter transmitting equipment operating from six volt supplies. Note that V_{ce} equals 12 volts. In class C circuits, the V_{ce} rating should be at least two times the supply potential. The 2N741, made by Motorola, is a similar bargain.

For v.h.f. receiving converters, operating from 6 volt supplies, the Motorola 2N971 and 2N975, are sheer giveaways! In converter applications, where the stages operate class A, one can operate this close to the —7 volt V_{ce} rating although it would not be considered good commercial design practice.

The Philco MADT, types 2N1726, 27, 28, 46 and 47 are superb transistors and sell for less than $1.50. Although these types are recommended for the broadcast band and shortwave, they have been tried in two meter converters and produce noise figures similar to the old 6BQ7 tube. Not bad for a buck-and-a-half! On six meters, they should work as well as any. The V_{ce} rating of these MADT transistors permits operation on 12 volt supplies.

Several other bargains are not listed because JEDEC 2N number assignments have not been made. Noteworthy is the Philco T2028 MADT, which has a guaranteed noise figure of less than 4 db at 200 mc. This device should *approach* Nuvistor tube performance at 144 mc. It is interesting to note that Philco also has a device which carries a guaranteed noise figure of 3.3

[*Continued on page 86*]

*V.H.F. Editor, *CQ*

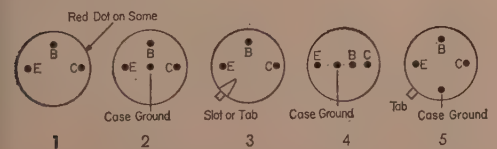


Fig. 1—Basing diagrams for the transistors listed in the chart.

Type	Price	Outline	Base	V_{ce} (volts)	I_c (ma)	P_c (mw)	Alpha (mc)	h_{fe}
2N344	$3.45	TO-24	1	— 5	— 5	20	50	22
2N345	4.35	TO-24	1	— 5	— 5	20	50	35
2N384	3.30	TO-44	2	—40	— 10	240	100	60
2N588	1.43	TO-24	1	—15	— 50	30	250	—
2N705	4.17	TO-18	3	—15	— 50	300	300	40
2N710	4.17	TO-18	3	—15	— 50	300	300	50
2N711	1.80	TO-18	3	—12	— 50	300	300	20
2N741	2.15	TO-18	3	—15	—100	150	300	25
2N961	4.40	TO-18	3	—15	—100	150	460	20
2N962	3.60	TO-18	3	—12	—100	150	460	20
2N966	4.40	TO-18	3	—12	—100	150	460	40
2N968	3.90	TO-18	3	—15	—100	150	320	20
2N969	2.70	TO-18	3	—12	—100	150	320	20
2N970	2.25	TO-18	3	—12	—100	150	320	20
2N971	1.20	TO-18	3	— 7	—100	150	320	20
2N972	4.45	TO-18	3	—15	—100	150	320	40
2N973	3.15	TO-18	3	—12	—100	150	320	40
2N974	2.60	TO-18	3	—12	—100	150	320	40
2N975	1.55	TO-18	3	— 7	—100	150	320	40
2N1023	4.54	TO-44	2	—40	— 10	240	120	60
2N1177	3.63	TO-45	4	—30	— 10	80	140	100
2N1178	3.30	TO-45	4	—30	— 10	80	140	40
2N1179	2.79	TO-45	4	—30	— 10	80	140	80
2N1180	2.48	TO-45	4	—30	— 10	80	140	80
2N1396	3.71	TO-33	5	—40	— 10	240	100	90
2N1397	4.95	TO-33	5	—40	— 10	240	120	90
2N1499	1.43	TO- 9	3	—20	—100	60	100	70
2N1726	1.32	TO- 9	3	—20	— 50	60	150	60
2N1727	1.28	TO- 9	3	—20	— 50	60	150	60
2N1728	1.23	TO- 9	3	—20	— 50	60	150	60
2N1742	2.93	TO- 9	3	—20	— 50	60	600	33
2N1743	2.87	TO- 9	3	—20	— 50	60	600	33
2N1744	2.79	TO- 9	3	—20	— 50	60	600	33
2N1745	1.83	TO- 9	3	—20	— 50	60	200	33
2N1746	1.35	TO- 9	3	—20	— 50	60	235	60
2N1747	1.43	TO- 9	3	—20	— 50	60	100	60
2N1748	1.70	TO- 9	3	—25	— 50	60	100	45
2N1749	1.61	TO- 9	3	—40	— 10	75	100	45
2N1752	2.16	TO- 9	3	—12	— 50	60	106	250
2N1785	1.20	TO- 9	3	—10	— 50	45	125	60
2N1786	1.17	TO- 9	3	—10	— 50	45	125	60
2N1787	1.23	TO- 9	3	—15	— 50	45	125	60
2N1788	1.40	TO- 9	3	—35	— 50	60	150	60
2N1789	1.35	TO- 9	3	—35	— 50	60	150	60
2N1790	1.31	TO- 9	3	—35	— 50	60	150	60
2N1864	1.28	TO- 9	3	—20	— 50	60	125	60

A New Approach To The ZL Special

BY E. M. WAGNER*, G3BID

The mechanical problems that faced the builder of a ZL Special frequently stopped the project cold. G3BID's approach eliminates the problems and permits this unusual antenna to be built "plumbers delight" style.

THE ZL Special has been in existence for a long time but it has never been very widely used. This is probably due to certain difficulties which arise in its practical construction. In effect the ZL Special is a two element beam in which the elements are fed 135° out of phase. This is achieved by placing the two elements ⅛ of a wave length apart and feeding them through a delay line of ⅛ of a wave length which has 180° twist in it. This feeds them 180° out of phase minus the 45° delay imposed by the delay line.

The Problem

Certain practical difficulties arise. The spacing of the elements being ⅛ of a wave length they would have to be connected together by a delay line with a velocity ratio of unity. As no such cable exists, the delay line—an electrical ⅛ of a wave length long—is physically shorter than the ⅛ of a wave length in free space which separates the two elements and, therefore, it doesn't reach.

Various compromises have been used. The simplest and least effective is to use a delay line which is slightly too long in order that it should reach between the two elements. This normally does not give the correct phase relationship.

The other method used is to make the elements folded dipoles and increase the spacing between the two conductors of each folded dipole so that if they are placed in the horizontal plane with the split portions nearest each other, the distance between these two feed points is appreciably less than ⅛ of a wave length. Thus the feed line of the correct *electrical* length will reach. The spacing between the two conductors of each element is arranged so that the *center line* is still ⅛ of a wave length apart in free space.

This means that the beam must be constructed of wires supported on insulators on a wooden framework. This causes the ZL Special to be a clumsy device compared to other rotary beams and may well account for its lack of popularity in the past, particularly as its performance, electrically, is extremely satisfactory. It provides a gain of 7 db and, in my experience, is a very much better beam than any other two-element type and approaches the performance of a three-element beam.

*5 Ferncroft Avenue, London N.W. 3, England.

The Cure

It is possible to overcome this difficulty in the following way. The two elements can be made of aluminum or duraluminum tubing as in any ordinary plumber's delight beam. The split portion or feed points hang vertically underneath the solid portion which can be mounted solidly on the boom in plumber's delight fashion.

The delay line is then connected between the two elements as shown in fig. 1. As explained above, the delay line will now be too long electrically if the array is fed at one end. However, a feed point can be chosen so that the distance

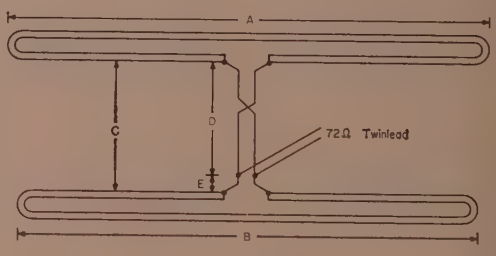


Fig. 1—Configuration for the improved ZL special. Note that the phasing line has one twist only for phase reversal. Telcon 150 ohm cable was used for the phasing line and it has a velocity ratio of 0.79. The dimensions for various frequencies are shown in the chart below.

Mc	*A*	*B*	*C*
14.1	33′ 1.8″	31′ 4.8″	8′ 8.6″
14.2	32′ 10.9″	31′ 2.1″	8′ 7.9″
14.25	32′ 9.6″	31′ 0.8″	8′ 7.3″
14.3	32′ 8.3″	30′ 11.6″	8′ 7.2″
14.35	32′ 6.8″	30′ 10.3″	8′ 6.8″
14.4	32′ 5.5″	30′ 9.0″	8′ 6.5″
21.2	22′ 0.75″	21′ 1.0″	5′ 8.75″
21.3	21′ 11.5″	21′ 0.0″	5′ 9.5″
21.4	21′ 11.0″	20′ 11.25″	5′ 9.0″

from the feed point to one element *minus* the distance from the feed point to the other element is ⅛ of a wave length multiplied by the velocity factor.

Thus in fig. 1 where distance C is ⅛ of a wave length in free space, distance D (from the feed point to the rear element) minus distance E, the distance from the feed point to the forward element, equals ⅛ of a wave length multiplied by the velocity factor of the cable concerned.

It may be shown mathematically as:

$D + E = C$

$D - E = C \times k$

where k is the velocity factor of the line used. From the above, the following formula is derived.

$$E = \frac{C}{2}(1 - k)$$

As an example we might wish to operate at 14.1 mc using Telcon K24 150 ohm line. From the data in fig. 1, $k = 0.79$ and C = 8′ 8.6″. Convert C to inches, plug into the formula and we have:

$$E = \frac{104.6''}{2}(1 - 0.79)$$

$E = 52.3''$ (0.21)

$E = 11''$

[*Continued on page 86*]

A Transistorized D.C. Voltmeter

BY DON ROWLAND*, K5DVI

HERE is a short, simple construction article written for the solid-state enthusiast and for the many amateurs who have found a need for an ultra-small portable electronic d.c. voltmeter which combines accuracy with low cost.

The unit described is a transistorized version of the v.t.v.m., but without the disadvantages of that instrument. This one requires no warm-up time and is independent of the a.c. line.

The only critical parts are the multiplier resistors, where only precision units should be used. However, since these are readily available in 1% tolerances, at small cost, they should present no difficulty.

Circuit Description

The circuit utilizes an inexpensive d.c. milliammeter connected to a direct coupled d.c. amplifier consisting of two Raytheon p.n.p. transistors. This provides a full scale sensitivity of 10 microamperes.

The input resistance of the device is 100,000 ohms per volt and compares favorably with or exceeds that of commercial units.

Fifteen voltage ranges are shown, but any number less than that may be used merely by eliminating the multiplier resistors for the unwanted ranges and selecting a switch with fewer positions.

The test lead for J_1 is made from thin coax or shielded wire.

To calibrate the instrument, zero the meter, set the range switch to the 1-volt position. Apply an accurately known source of 1 volt and set the CALIBRATE pot for full-scale deflection.

The entire unit can be built into a standard meter case if desired. Layout is not critical. ■

Multiplier	Resistance (megohms)	Range (volts)	Multiplier	Resistance (megohms)	Range (volts)
R_1	.10	0-1	R_9	5	0-50
R_2	.25	0-2.5	R_{10}	10	0-100
R_3	.30	0-3	R_{11}	25	0-250
R_4	.50	0-5	R_{12}	30	0-300
R_5	.75	0-75	R_{13}	50	0-500
R_6	1.0	0-10	R_{14}	75	0-750
R_7	1.5	0-15	R_{15}	100	0-1000
R_8	2.5	0-25			

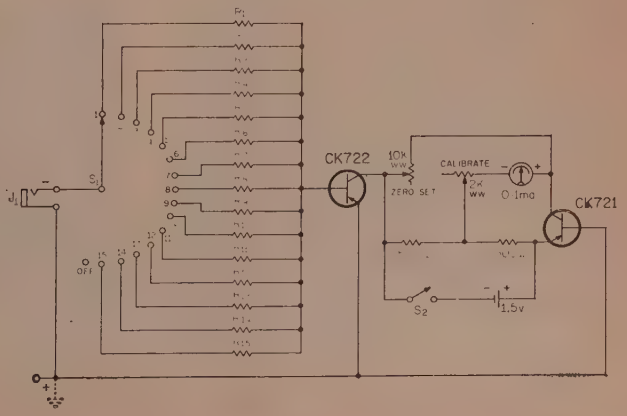


Fig. 1—Circuit of a simple transistorized d.c. voltmeter.

* Chief Engineer, KSIG, Crowley, Louisiana.

DX DX DX DX DX

URBAN LE JEUNE, JR.*, W2DEC

The following certificates were issued between the period from November 6th, 1962 to and including December 5th, 1962:

CW-PHONE WAZ

1752	W2TQC	Harold M. Jaffe
1753	W3HHK	Samuel M. Rotondo
1754	DJ2EO	Siegfried Dusch
1755	OE8SH	Herbert Setz
1756	PAØOI	Ger Leenheer

ALL-PHONE WAZ

184	DL3RK	Walter Geyrhalter

TWO-WAY SSB WAZ

138	K4AJ	Robert Lee Stewart
139	GM3JDR	D. Robertson
140	KR6HL	Edward F. Salter
141	W4WDI	David A. Rawley, Jr.

CW WPX

396	W2EMW	Louis R. Mele
397	DJ2EO	Siegfried Dusch
398	W1FPS	Raymond N. Flood
399	W1QQV	Philip P. Snow
400	ZS4MG	Sid Coosner
401	VE1AE	W. A. Kelso
402	PZ1AH	Andre S. Soeperman
403	WØFLK	John M. Gowen

PHONE WPX

81	W9EXY	Donald A. Jensen

SSB WPX

122	W4EEU	A. W. Westmont
123	LA5LG	P. Gunderson

MIXED WPX

53	K2ZRO	K. J. Deskur
54	ZS4MG	Sid Coosner
55	GI3OQR	Dick Gibson

WPX ENDORSEMENTS

	Mode	Continent	Band
W1QQV	CW		14
W2EMW	CW	E	14
W6KG	CW	N	
DJ2KS	CW		21-14
DL1QT	CW		21
ZS4MG	CW	E	14

A-Asia; *E*-Europe; *F*-Africa; *N*-North America; *O*-Oceania; *S*-South America.

LX3TA which was operated in the c.w. portion of the DX Contest almost fell through because of our lack of licensing reciprocity. W4UWA, who is also DJØHZ, applied for an LX license but was turned down because of his U.S. citizenship and the United States lack of non-reciprocal licensing. Fortunately, DL1TA came to the rescue with an LX license. The moral to this story is quite simple:

We Hams in the United States simply are not doing enough to encourage our reciprocal licensing bill. We had the ball rolling but it appears to be losing momentum. What say we all give it another shove!

AC3 Sikkim: VU2AX, ex-AC4AX, has left Tibet and is now in Sikkim. He has been issued the call of AC3AX and promises to be active in the near future. Gus also has permission to operate from AC3 land but the border situation may possibly cancel both of these operations. If this situation is resolved, a rig may be made available for AC3AX.

ET2 Eritrea: Dick Cormier, ex-ET2US/ET2 and ET3RC writes from Iran that he expects to be licensed about the time you are reading this. Any QSLs for his ET2US/ET2 or ET3RC operation can be handled via his new QTH at APO 205, New York, N. Y. Dick was the only one with written permission to use ET2US/ET2. When he left Eritrea in November, the following licenses had been issued. ET3's USN, HP and AM with several others in the mill. The licenses there were issued by the Ethiopian Telecommunications Bureau which was issuing ET3 licenses

HM5BF and HM8BG are the first husband and wife team to be licensed in Korea. They are shown here with their 3 Jr. Ops. The neat rig runs 120 watts to an 829 final. They have been very active on 40 meters lately. *(Tnx W7LZF).*

*Box 35, Hazlet, New Jersey.

WPX HONOR ROLL

C.W. WPX

W2HMJ	668	W9GFF	503	W3BCY	457	W8IBX	416	VE1AE	400	TG9AD	381
W8KPL	632	G3EYN	503	DL3RK	454	WØMCX	416	VE4OX	400	DL6VM	376
W5KC	619	YU1AG	503	K9EAB	451	K2PFC	415	VK3KB	400	PAØSNG	369
W2AIW	598	W5LGG	502	PAØLOU	451	W5AWT	412			K9EAB	366
W6KG	574	IT1AGA	502	DL1YA	450	WA2DIG	411	**Phone WPX**		G3FKM	366
W2EQS	572	K2CPR	501	DL9KP	450	K5LZO	411	CT1PK	587	W8UMR	363
K6CQM	565	W9SFR	501	W8JIN	449	W2PTD	411	G3DO	565	SM3EP	361
W5OLG	564	K2ZKU	500	W9UZS	447	W4DKP	410	W9WHM	562	W5ERY	358
W2NUT	550	W2EMW	500	W8RQ	445	W1CKU	408	W8WT	562	W8JIN	356
W4OPM	549	G2GM	499	W3AYD	443	K4JVE	407	W9YSQ	471	PY2CK	354
W9YSX	544	W2MUM	495	OE1FF	442	W5AFX	407	MP4BBW	454	5A5TO	353
W9UXO	542	W1WLW	494	LA5HE	437	W7HDL	405	PAØHBO	453	W1ORV	351
K2UKQ	535	SM5CCE	488	W3BQA	437	W4YWX	404	W6YY	448	LA5HE	351
W2HO	526	W4BYU	487	W8UMR	429	GI3OQR	404	G8KS	430		
DL1QT	518	ON4QX	486	WØAUB	429	ZS4MG	404	VK6RU	421	**S.S.B. WPX**	
K9AGB	515	W8PQQ	481	W2RA	428	K2ZRO	403	W3AYD	420	MP4BBW	462
W1IJB	513	W4HYW	478	K5LIA	428	W9IHN	403	W9UZC	418	W4OPM	451
W1EQ	512	W3OCU	466	OK1MB	428	VE6VK	403	F8PI	418	G3AWZ	428
W6WO	511	K6SXA	464	W3CGS	426	K4TEA	402	PZ1AX	413	HB9TL	423
W2GT	510	W2KIR	463	W1EIO	425	G3HIW	402	K2CJN	409	W3NKM	402
SM7MS	510	DJ2KS	462	SM5WI	424	WØVBQ	401	DL3TJ	404	G8KS	400
W8LY	506	PY4OD	462	WØPGI	420	IT1TAI	401	W1UOP	402	G3DO	367
W9DWQ	506	JA2JW	461	HB9TT	419	VE3JZ	401	G3NUG	400	G3NUG	356
		W9WCE	458	OK3EA	419	OE3WB	400	OE1FF	382	TI2HP	356
								SP7HX	381		

W3MAC	354	G3FKM	255								
K9EAB	350	UR2AR	255								
PZ1AX	345	TG9AD	252								
W2HXG	324	W4RLS	251								
W2VCZ	320										
W2YBO	318	**MIXED WPX**									
W8PQQ	315	W8JIN	605								
W1ORV	307	G3DO	597								
K4PUS	305	W4OPM	595								
W6YMV	304	W3OCU	588								
K1IXG	303	W8WT	584								
K2TDI	300	W6YY	570								
WA2SFP	300	W4BYU	557								
KØRDP	300	K9EAB	553								
WØCVU	291	W3AYD	552								
W1VOP	273	HB9EU	551								
K2JFV	266	YU1AG	533								
K2MGE	263	W2GT	528								
W3AYD	262	G8KS	520								
W4EEU	262	W5LGG	509								
W4NJF	260	W9DWQ	508								
DJ3CP	260	K2ZKU	508								
VE3BKL	259	W3KDP	501								
W3VSU	256	W8UMR	500								
XE1CV	256	LA5HE	500								

to both Ethiopia and Eritrea. It looks as if we will be losing another country shortly. *(Tnx ET3RC).*

ET3 Ethiopia: ET3JK and ET3FW are presently active from Ethiopia. They are installing short wave transmitters for the Lutheran World Federation Broadcasting Service. ET3JK will remain in Ethiopia until June of 1964 and ET3FW until May of 1965. At present, they are using an Eldico SSB-100 and are active on s.s.b. and c.w. They plan to be giving 40 meters a try very shortly. ET3LM has closed down operation and may be reached at his home QTH which is W7KMF. *(Tnx ET3JK).*

JY Jordan: The DXpedition to Jordan which had been planned by IT1's TAI and ZGY was cancelled due to the fact that the Jordan authorities are not willing to license non-citizens at this time. Everything else had been arranged and all equipment, visas, *etc.* obtained. Dom and Pietro have not given up hope completely but things do not look promising at this time. *(Tnx VERON).*

KB6 Canton Island: K6BZ and KG6ALG are the only two hams who are presently licensed on Canton Island. KG6ALG/KB6 is presently on stateside vacation but will return in March. Either operator may be reached c/o FAA, Canton Island. *(Tnx K1BPM).*

KH6 Kure Island: KH61DY has been reactivated and is presently active on 20 and 15 meter s.s.b.

LA Spitzbergen: LA9RG has been operating from Spitzbergen with a KWM-1 on a fixed frequency of 14252. He is active every Friday and Saturday with G3DO quite frequently acting as MC. *(Tnx LIDXA).*

LH4 Bouvet Island: Gus did his usual stellar from Bouvet where he signed LH4C. This was the first operation from this Island and it will probably remain the only operation for a long time to come. The Island was completely covered with snow and ice while Gus was there and during a local blizzard he was heard to remark one evening, "I am sure glad that this is their summer season." During a 72-hour period in which time he operated virtually without sleep, an almost unbelievable 3800 QSOs were had. Our hats are off to Gus for putting this prefix on the map in such fine style when time, weather and just about every other possible thing was happening to produce difficulty after difficulty. A special vote of thanks also goes to LA5HE who personally walked a license application through for Gus with LA FCC.

PJ5M Sint Maarten Island: W3ZQ's recent trip to Sint Maarten Island resulted in 900 QSOs, 666 of which were during a 15-hour period of the phone contest. A KWM-2 was used.

TA Turkey: A group of W1's are planning on a DXpedition to Turkey. They have been issued

"I never should have sold him my DX-100," moans Warren, W6IBD, after missing out on a choice one. *(Tnx W6RW).*

One of the West Coast's most popular DX teams. Ed, K6VTQ, and his charming XYL, Millie, K6GAC. *(Tnx W6RW).*

Bob, ex EP2BK, whom I had the pleasure of meeting recently, is now in Indonesia where he is hoping to obtain a license. The rig shown here passed out the first Asian contact to many on 80 and 160 meters *(Tnx K2UKQ)*.

a license but they are not allowed to bring equipment into the country. They can, however, bring in parts so they will probably have to build a kit on site. *(Tnx WGDXC.)*

VP1 British Honduras: VP1AM recently had her call changed to VP1MM. Mary is a YL and her address is Box 411, Belize, B. Honduras. *(Tnx W1BPN).*

VS9 Kuria Muria: Due to the uncertain political situation and lack of suitable transportation, the RAF DXpedition to this spot was officially cancelled. There is a possibility that they may make another trip to VS9K.

XE4 Revilla Gigedo: There is a good possibility that XE1CV along with XE1's CE, AZ and GJ may DXpedition to this spot in the very near future. *(Tnx VERON).*

ZA1 Albania: ZA1KFF has been spasmatically active on 14 mc c.w. Whether or not this is finally a good ZA or another in the long line of phonies only time will tell.

ZD8 Ascension Island: ZD8JP is now active on s.s.b. with a borrowed KWM-1. *(Tnx LIDXA).*

ZL1 Kermadec Islands: Ian, ZL1ABZ, is now active from the Kermadec Islands on s.s.b. as had been promised. Ian, as you will remember was the operator of ZL4JF on Campbell Island. His stay on Kermadec will be for approximately one year. He is active as time permits from 0330 to 0730 GMT. The usual operating frequency is

One of the top DXers in Japan is JA1AG. Some of the wallpaper here includes such exotic DX as AC3SQ, AC5PN and YA1AA. *(Tnx JA2KW).*

14290 kc ± 5 kc, with occasional operation between 14120 and 14130 kc. QSLs via Jock, ZL2GX. *(Tnx VERON and WGDXC).*

ZL4 Campbell Island: ZL4JF, the former call of Ian, who is now ZL1ABZ, is now being used by a new licensee. His name is John Washer and it appears that he is a good c.w. operator and thus far has only been heard on that mode. Jock, ZL2GX, has suggested that he use a fixed frequency of 14050 kc so that it will be easy for the boys to find him. To date, most of his operation has been confined close to this frequency. His major activity, time permitting, is in the area of 0400 GMT to 0730 GMT. There is another station licensed and active on the Island and that is ZL4OG, however, this station is the ZL equivalent of our Novice license and may only operate on 80 meter phone and c.w. *(Tnx VERON).*

ZM6 Western Somali: Joe, WA6TGY, learns via Danny, ZM6AW, that there is considerable interest among the locals of ZM6 land in amateur radio. Unfortunately, the lack of equipment represents a deterrent of considerable consequences. Perhaps enough gear could be donated to permit

Jan, SP8MJ, is a member of CHC and a confirmed certificate chaser. He is shown here with his son, Tadeusz. *(Tnx K2UKQ).*

establishing a permanent station at this relatively rare spot. Anyone interested is urged to write W6GN or WA6TGY.

ZS2MI Marion Island: ZS1XU is the present operator of ZS2MI and he has been fairly active on 20 meter c.w. especially on weekends. 14150 is preferred. There is a possibility of some a.m. phone operation from this spot shortly. *(Tnx W1BPM).*

ZS3 Southwest Africa: ZS3LW is now ZS6ZW and Van's present address is 126 Windsor St., Gerdview, Germinston, TVL, S. Africa. His ZS3 contacts may stil be verified via W1BPM, who is his QSL manager. *(Tnx W1BPM).*

4W1 Yeman: 4W1AA has been active almost daily on 14030 between 1500 and 1700 GMT. Rudy, W3CXX, spoke to him about a QSL Manager and from that QSO on, 4W1AA was telling everyone to QSL via W3CXX. Shades of ZA2GB. The 4W1AA operation of about six months ago was definitely a phoney one and this sounds and acts like the same operator. Rudy requests that cards not be sent to him

[*Continued on page 81*]

CONTEST CALENDAR

FRANK ANZALONE,* W1WY

CALENDAR OF EVENTS

February	9-11	ARRL DX Phone
February	16-17	BERU
February	15-17	QCWA Party
February	23-25	ARRL DX C.W.
March	2-3	YL/OM Phone
March	9-11	ARRL DX Phone
March	16	*VHF Amateur*
March	16-17	YL/OM C.W.
March	23-25	ARRL DX C.W.
March	23	APDX (Pakistan)
March	30-21	*CQ* WW S.S.B.
March	30-31	REF C.W.
March	30-31	West Virginia QSO Party
April	6-7	Helvetia 22
April	20-21	REF Phone
April	27-28	PACC C.W.
May	4-5	PACC Phone
May	11-12	OZ CCA C.W.
May	18-19	OZ CCA Phone
May 31 —	June 3	CHC/HTH Party

ARRL DX

Phone: February 9-11 and March 9-11.
C.W.: February 23-25 and March 23-25.

Starting time in each instance is 7:00 P.M. EST Friday and ending time 7:00 P.M. EST Sunday. Phone and C.W. are separate contests.

This is the 29th year the ARRL has held its DX contest. It's the world working the USA and Canada, KH6 and KL7 are considered states and not DX.

The rules are unchanged, DX stations will send RS or RST report followed by a three digit number representing the power they are using. Our boys will follow the signal report with their state or province.

Each completed contact is good for three points and your multiplier is derived from the different countries you work on each band. The DX boys will use our call areas as their multiplier, not states or provinces. There are 21 call areas per band.

B E R U

Once again let us remind you that this is a contest limited to stations of the British Empire. Canada and islands in the Caribbean for this continent.

QCWA Party

Starts: 2200 GMT Friday, February 15th.
5 P.M. EST Friday, February 15th.

Ends: 2200 GMT Sunday, February 17th.
5 P.M. EST Sunday, February 17th.

The sixth annual QSO party is organized for QCWA members, and they alone are eligible for the QCWA Plaque. However CHCers are invited to work QCWA stations for credits toward their own awards.

There is no point scoring or multiplier involved, just see how many QCWA members you

[*Continued on page 88*]

* 14 Sherwood Road, Stamford, Conn.

PACC 1962 C.W. Contest Results

USA & Canada			Other Countries *Winners Only*		
W1KQF	1326	UB5KED	3360	OH2SB	1092
W1JYH	483	UR2KAE	2940	UP2NV	1014
K4BAI	54	UA1KAG	2700	HA8KCI	900
W5WZQ	168	G3EYN	2091	UC2KAR	756
W5KC	27	DM4CI	2064	LA2Q	720
W6UZX	12	SP8MJ	2052	GW3MRI	648
W8JIN	552	OK3IR	1953	SM6CMU	624
W9WCE	294	HB9QA	1440	F2PO	561
VE1AE	270	OZ4H	1350	UQ2DB	396
VE3EVK	96	ON5NW	1260	UI8KAD	294

Top man in the Netherlands was PAØLV with 79,514 points on C.W. and 9,730 points on Phone.
Activity in the phone section of the contest was very sparse and confined to Europe only.

Johnny Barrows, DL4HU, K1ECT, CN8HY, presently active on s.s.b. from Germany is one of the original crusaders for Reciprocal Licensing. Johnny, along with KØLIU, K5QKV, W7UUW, W7EIT, K5ISX, K1BVI and W7HNT in 1957, as Charter Members, formed the Sevilla American Radio Amateurs of Spain. Johnny continues his efforts via radio contacts and the Bitburg ARC Club Bulletin QRZ, which he edits. *(Photo via WB2CCO).*

PROPAGATION

GEORGE JACOBS*, W3ASK

LAST MINUTE FORECAST

The following is a forecast of day-to-day propagation conditions expected during February, 1963. This forecast attempts to predict *specific* days upon which openings shown in the Propagation Charts in this column are most likely to occur, and the expected quality of the openings. For example, the following forecast shows that circuits rated (2) in the Propagation Charts are most likely to open with "good-to-fair" quality (B-C) when conditions are above normal (February 26), and with "fair-to-poor" quality (C-D) when conditions are expected to be normal. Circuits rated (2) are not expected to open on those days forecast to be "disturbed", etc.

PREDICTED PROPAGATION CONDITIONS & CIRCUIT QUALITY

Prop. Chart Forecast Rating	*Above Normal Days (WWV rating 6 or higher)* Feb. 26	*Normal Days (WWV rating 5)* Feb. 1-2, 8-9, 15-17, 22-23, 25, 27-28	*Below Normal Days (WWV rating 4)* Feb. 3-4, 7, 10-11, 14, 18, 21, 24	*Disturbed Days (WWV rating 3 or less)* Feb. 5-6, 12-13, 19-20
(1)	C	D-E	E	E
(2)	B-C	C-D	D	E
(3)	A-B	B-C	C-D	D-E
(4)	A	A-B	C	D

Where:

A—An excellent opening with strong steady signals.
B—A good opening, moderately strong signals, with little fading & noise.
C—A fair opening, signals fluctuating between moderately strong & weak, with moderate fading and noise.
D—A poor opening, signals generally weak, with considerable fading and high noise level.
E—A very poor opening, or none at all.

FEW 10 meter DX openings are forecast for February as the sunspot cycle continues to decline. When propagation conditions are normal or better, good 15 meter openings to many areas of the world are expected to occur during the daylight hours. The best band for DX openings during February is expected to be 20 meters. The band is forecast to open shortly after sunrise, and often may remain open to some area of the world or another through the early evening hours.

Forty meters is expected to be the best band for DX during the hours of darkness, with openings predicted to many areas of the world. Fairly good 80 meter openings are also predicted during the hours of darkness, and some 160 meter DX openings are also likely to occur to some areas of the world between sunset and sunrise. (The annual 160 meter DX Tests will be conducted on February 3 and 17 from Midnight to 2:30 A.M. EST See December's PROPAGATION Column for more details).

An increase in the occurrence of auroral displays usually takes place during February and the early spring months. During such displays there is a tendency for ionospheric disturbances or radio storms, to take place. While DX conditions on the high frequency bands may become poor, or blackout entirely during such storms, unusual short-skip openings for distances up to approximately 1300 miles may be possible on 10, 6 and 2 meters. These openings occur by way of reflection from the ionization produced by the auroral display. Check the "Last Minute Forecast" appearing at the beginning of this column for those days that are expected to be "disturbed" or "below normal"

Sunspot Cycle

The Zurich Solar Observatory reports the monthly sunspot number of 24 for November 1962. This results in a 12-month running smoothed sunspot number of 38 centered on May 1962. A smoothed sunspot number of 27 is predicted for February 1963 as the solar cycle continues to decline slowly.

Weekly CRPL Forecasts

Day-by-day propagation forecasts for a full week in advance are available without charge to those in the field of radio communications from the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado. These forecasts, appearing weekly in the CRPL Jb series, are given in the CRPL-WWV 1-9 quality rating system for typical North Atlantic and North Pacific transmission paths. The Jb series also contain observed quality figures for the week previous to the date of issue, and other geomagnetic information. Requests for these weekly forecasts should be sent directly to the Central Radio Propagation Laboratory, NBS, Boulder, Colorado along with a QSL card.

73, George, W3ASK

*11307 Clara St., Silver Spring, Md.

February & March 1963

Time Zone: EST (24-Hour Time)

EASTERN USA To:

	10/15 Meters	*20 Meters*	*40 Meters*	*80/160 Meters*
Western & Central Europe	10-13 (1)* 08-10 (1) 10-12 (2) 12-14 (3) 14-16 (1)	06-07 (1) 07-11 (2) 11-13 (3) 13-15 (4) 15-16 (2) 16-19 (1)	16-18 (1) 18-19 (2) 19-23 (3) 23-02 (2) 02-05 (1)	18-20 (1) 20-23 (3) 23-01 (1) 20-21 (1)† 21-00 (2)† 00-01 (1)†
Eastern Europe & Eastern USSR	09-13 (1)	07-12 (1) 12-14 (2) 14-16 (1)	19-02 (1)	20-00 (1) 21-23 (1)†
Southern Europe & North Africa	09-14 (1)* 07-09 (1) 09-11 (2) 11-13 (3) 13-14 (2) 14-17 (1)	06-07 (1) 07-12 (2) 12-14 (3) 14-16 (4) 16-17 (2) 17-19 (1)	17-18 (1) 18-19 (2) 19-00 (3) 00-01 (2) 01-03 (1)	19-21 (1) 21-23 (2) 23-01 (1) 20-00 (1)†
South Africa	10-13 (1)* 07-11 (1) 11-14 (2) 14-17 (1)	14-16 (1) 16-18 (3) 18-19 (2) 19-21 (1)	18-20 (1) 20-21 (2) 21-23 (1)	19-22 (1) 19-21 (1)†
Eastern Mediterranean	09-13 (1)	10-14 (1) 14-16 (2) 16-19 (1)	18-20 (1) 20-21 (2) 21-23 (1)	19-23 (1) 20-22 (1)†
Central Asia	07-09 (1) 16-19 (1)	07-09 (1) 12-15 (1) 17-19 (1)	05-07 (1) 18-21 (1)	*NIL*
Southeast Asia	07-09 (1) 17-19 (1)	06-07 (1) 07-09 (2) 09-11 (1) 17-21 (1)	06-08 (1) 17-20 (1)	*NIL*
Far East	16-19 (1)	07-09 (1) 16-17 (1) 17-19 (2) 19-21 (1)	05-08 (1)	06-07 (1)
Pacific Islands & New Zealand	13-18 (1)* 12-17 (1) 17-19 (2) 19-21 (1)	19-21 (1) 21-00 (2) 00-07 (1) 07-09 (2) 09-11 (1)	00-02 (1) 02-06 (3) 06-08 (1)	02-03 (1) 03-05 (2) 05-07 (1) 02-06 (1)†
Australia	16-19 (1)* 09-11 (1) 16-18 (1) 18-20 (2) 20-22 (1)	06-07 (1) 07-09 (3) 09-10 (2) 10-13 (1) 20-23 (1)	04-05 (1) 05-07 (2) 07-09 (1)	05-07 (1) 05-07 (1)†
South America	07-14 (1)* 14-16 (2)* 16-18 (1)* 06-08 (1) 08-10 (3) 10-14 (2) 14-17 (4) 17-19 (2) 19-21 (1)	14-16 (1) 16-18 (2) 18-20 (4) 20-22 (3) 22-00 (2) 00-06 (1) 06-08 (2) 08-10 (1)	18-19 (1) 19-20 (2) 20-03 (3) 03-05 (2) 05-07 (1)	19-21 (1) 21-03 (2) 03-04 (1) 21-03 (1)†
McMurdo Sound Antarctica	15-17 (1) 17-19 (2) 19-21 (1)	17-19 (1) 19-22 (2) 22-00 (1)	23-06 (1)	*NIL*

Time Zones: CST & MST (24-Hour Time)

CENTRAL USA To:

	10/15 Meters	*20 Meters*	*40 Meters*	*80/160 Meters*
Western & Central Europe	09-11 (1)* 08-10 (1) 10-13 (2) 13-14 (1)	07-11 (1) 11-13 (2) 13-14 (3) 14-17 (1)	17-19 (1) 19-22 (2) 22-02 (1)	19-20 (1) 20-22 (2) 22-23 (1) 20-22 (1)†
Eastern Europe & Eastern USSR	08-13 (1)	07-08 (1) 08-11 (2) 11-14 (1)	19-01 (1)	20-23 (1)
Southern Europe & North Africa	10-13 (1)* 08-10 (1) 10-13 (2) 13-15 (1)	06-12 (1) 12-14 (2) 14-15 (3) 15-16 (2) 16-18 (1)	17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	19-20 (1) 20-22 (2) 22-23 (1) 20-22 (1)†
Central Africa	11-16 (1)* 09-11 (1) 11-13 (2) 13-15 (3) 15-16 (2) 16-19 (1)	13-15 (1) 15-17 (2) 17-19 (3) 19-20 (2) 20-22 (1)	17-20 (1) 20-22 (2) 22-00 (1)	19-22 (1) 19-21 (1)†
Eastern Mediterranean	09-12 (1)	09-12 (1) 12-14 (2) 14-17 (1)	19-23 (1)	20-22 (1)
Central Asia	07-10 (1) 18-20 (1)	06-07 (1) 07-09 (2) 09-11 (1) 19-21 (1)	06-08 (1) 19-21 (1)	*NIL*
Southeast Asia	10-14 (1) 17-20 (1)	06-07 (1) 07-09 (2) 09-12 (1) 19-22 (1)	06-08 (1) 17-19 (1)	*NIL*
Far East	16-19 (1)* 15-16 (1) 16-20 (2) 20-22 (1)	06-07 (1) 07-09 (2) 09-11 (1) 16-19 (1) 19-21 (2) 21-23 (1)	02-09 (1)	05-07 (1)
Pacific Islands & New Zealand	12-18 (1)* 09-11 (1) 11-13 (2) 13-17 (1) 17-20 (2) 20-22 (1)	17-19 (1) 19-21 (2) 21-23 (3) 23-02 (2) 02-07 (1) 07-09 (2) 09-14 (1)	22-01 (1) 01-06 (3) 06-07 (2) 07-09 (1)	00-03 (1) 03-06 (2) 06-07 (1) 03-07 (1)†
Australia	14-19 (1)* 08-10 (1) 14-17 (1) 17-19 (2) 19-22 (1)	06-07 (1) 07-09 (3) 09-10 (2) 10-15 (1) 21-01 (1)	03-04 (1) 04-07 (2) 07-09 (1)	05-08 (1) 05-07 (1)†
North & Central South America	08-11 (1)* 07-08 (1) 08-10 (2) 10-13 (1) 13-16 (3) 16-17 (2) 17-19 (1)	06-07 (1) 07-09 (2) 09-15 (1) 15-17 (2) 17-20 (4) 20-22 (3) 22-01 (2) 01-03 (1)	18-20 (1) 20-02 (3) 02-04 (2) 04-07 (1)	20-21 (1) 21-02 (2) 02-06 (1) 21-03 (1)†
Argentina, Chile & Uruguay	09-13 (1)* 13-16 (2)* 16-18 (1)* 07-10 (2) 10-13 (1) 13-15 (2) 15-18 (3) 17-19 (2) 19-21 (1)	06-09 (1) 14-16 (1) 16-18 (2) 18-21 (3) 21-00 (2) 00-03 (1)	19-21 (1) 21-03 (2) 03-05 (1)	21-04 (1) 22-02 (1)†
McMurdo Sound, Antarctica	13-16 (1) 16-19 (2) 19-21 (1)	09-11 (1) 17-19 (1) 19-23 (2) 23-01 (1)	00-07 (1)	*NIL*

Time Zone: PST (24-Hour Time)

WESTERN USA To:

	10/15 Meters	*20 Meters*	*40 Meters*	*80/160 Meters*
Western & Central Europe	08-12 (1)	06-08 (1) 08-11 (2) 11-15 (1)	18-00 (1)	19-22 (1) 19-21 (1)†
Eastern Europe & Eastern USSR	07-10 (1)	06-07 (1) 07-09 (2) 09-12 (1)	19-23 (1)	20-23 (1)
Southern Europe & North Africa	07-08 (1) 08-10 (2) 10-13 (1)	07-11 (1) 11-13 (2) 13-15 (1)	18-19 (1) 19-21 (2) 21-22 (1)	19-22 (1) 19-21 (1)†

* Predicted 10 meter openings, all others 15 meters.
† Predicted 160 meter openings, all others 80 meters.

[*Continued on page 84*]

SPACE COMMUNICATIONS

GEORGE JACOBS*, W3ASK

On November 25, 1962 America's MARINER II spacecraft, rocketing towards the cloud-shrouded planet of Venus, established a new long-distance record for radio communications. At 7:46 A.M. EST, the Venus-probe transmitted data by u.h.f. radio telemetry to the Johannesburg, South Africa tracking facility from *22.5 million miles* in space. This broke the previous record established by the American PIONEER V satellite as it streaked towards a solar orbit on June 26, 1960.

With each passing day during November and December, MARINER II's signal was received over greater and greater distances. On December 14, the spacecraft accomplished an historic feat as it passed within 21,000 miles of Venus. All experiments aboard the spacecraft were functioning perfectly at the time, and information concerning the temperature of Venus and details about its atmosphere were transmitted back to earth over a distance of 36 million miles. At the time of writing this column, signals are still being received from MARINER II as it heads toward a solar orbit more than *37 million miles* in outer space!

MARINER's Communication Equipment

The record-breaking communication link from the MARINER II spacecraft was accomplished with a *3-watt* u.h.f. transmitter operating on 960 megacycles. The transmitter is completely solid-state except for a ceramic triode final amplifier.

Two transmitting antennas are mounted on the spacecraft. An omni-directional antenna was for tracking while MARINER II was at "near-in" distances, while a high-gain parabolic antenna is being used as MARINER plunges deeper into space.

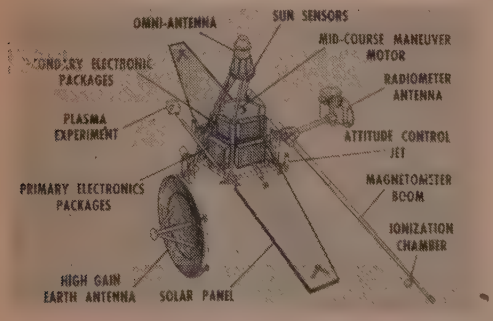
The high-gain antenna is hinged and equipped with a drive mechanism allowing it to be pointed at the earth on command. An earth sensor is mounted on the rim of the antenna's yoke to search for and keep the antenna pointed at the earth.

MARINER II's receiver is operating on a frequency of 890 megacycles. A receiving antenna mounted on one of the solar panels receives

[*Continued on page 84*]

This is the 53-foot radome housing a huge antenna aboard the world's first satellite communications ship, the USNS *Kingsport*. The ship will be used in various parts of the world as a mobile terminal for experimental communication satellites. Among the engineers aboard the *Kingsport* are Ralph Valusek, W4WQZ and Jerry DeWitt, W7RAI. Both Ralph and Jerry will be standing by to copy OSCAR III which is expected to be launched later this year. *(Bendix Photo).*

*11307 Clara St., Silver Spring, Md.



An artist's representation of the MARINER II spacecraft which made scientific and communications history by transmitting back to earth information about the planet Venus. The spacecraft's 3-watt u.h.f. transmitter broke all DX records by transmitting a strong signal over distances in excess of 37 million miles! *(NASA Photo).*

HAM CLINIC

CHARLES J. SCHAUERS*, W4VZO

As predicted about three years ago, the time would surely come when a number of manufacturers would follow Collins' lead and come out with transceivers. Today, there are six manufacturers making ham band units. However, not all units are full band transceivers. But this is as it should be.

Most hams do not operate on all bands anyway, but usually confine themselves to one or two bands. It is nice to have a set capable of covering 6 to 80 meters but the extra band coverage costs money.

As predicted too, prices for s.s.b. equipment have come down; and because of competition will continue to drop. But let us hope that those manufacturers planning on putting out transceivers for s.s.b. use will not "cut too many corners"—especially in the receiver section. Sensitivity is important but selectivity more so.

So when you buy a transceiver make certain you are getting as much receiver as you are transmitter.

Questions

Crystal Checking—"Any easy to check a crystal without using an oscillator?"

No. Crystals should be checked in the circuit designed for them—usually an oscillator or a filter circuit.

HX-500 Modification Notes—The HX-500 modification notes are now available from Hammarlund, 53 West 23rd St., N. Y. 10, N. Y. for HX-500 owners. Be sure to give your set's serial number when ordering the modification information.

Incidentally, when all the modifications are accomplished, they will bring the set up-to-date and make it better than ever.

Hammarlund deserves a pat-on-the-back for going to the expense of making the information available to its old customers. It is a nice feeling to know that some manufacturers do care and it is possible to go back to them for assistance on older equipment.

Adapt-O-Citer Info—I hope to come out with a transistorized version of the Adapt-O-Citer for all bands. Those of you who are using it to drive a single 6146 in class AB-1 should be careful of over-driving it—this is easy to do.

The original tube model as given in the June 1962 *CQ* was designed for 75 meter operation. When going to another band it is necessary to change the values of the phase shifting network components, as well as the r.f. coils. We did not give the values for the other bands inasmuch as we did not actually put the adapter on any band but 75 meters.

Those hams who substituted parts in the adapter and are having trouble getting proper carrier suppression should check for r.f leakthrough, poor diodes (not matched) and possible final oscillation, indicating a need for neutralization.

We are still offering a worthwhile prize for the first printable picture of a completed Adapt-O-Citer.

Tube Tester Adapter—Sencore, 426 Westgate Drive, Addison, Illinois, has come out with their TM-116 adapter which can be used with any manual tube tester to check Sylvania 10 pin, GE 12 pin compactron and RCA 9 pin Novar and 5 pin Nuvistor tubes.

The adaptor plugs into your present checker in a 6V6, 6J5 or 35Z5 socket position. It will work on the older and surplus tube checkers in a very fine manner.

For more information and the name of your nearest distributor write Sencore at the address given.

Hi-fi "I" (Again)—"My transmissions are bothering my neighbor's high fidelity set. I had this trouble once before with another neighbor and cured the trouble by installing 75K ohm ½ watt resistors in series with the grid of each stage bypassed with a .0001 mf condenser to ground. But this does not work on this particular hi-fi set. What else should I do?"

Try a 2½ millihenry r.f. choke in each speaker lead. If this does not work try a brute-force filter in the 110 v.a.c. line—at the hi-fi. Be sure that the hi-fi amplifier chassis is grounded. Good luck!

[*Continued on page 82*]

*c/o *CQ*, 300 W. 43 St., New York 36, N. Y.

sideband sideband sideband

SIDEBAND

IRV & DOROTHY STRAUBER*, K2HEA/K2MGE

SSB DX HONOR ROLL

TI2HP 276	W3KT 241	K6MLS 227
W8EAP 275	W6PXH 241	W1AOL 227
VQ4ERR 274	W2VCZ 241	G3FKM 226
W8PQQ 271	PZ1AX 240	W2YBO 225
W2ZX 271	W5IYU 237	W2VZV 219
PY4TK 267	DL1IN 236	UA3CR 217
HB9TL 264	G3NUG 235	WA2IZS 213
W2FXN 263	W8YBZ 235	K4AJ 213
W6UOU 260	W6RKP 234	W3VSU 210
W3NKM 259	W6WNE 232	WA6EYP 208
WØQVZ 259	G2BVN 231	W3CGS 206
K4TJL 256	K6ZXW 231	W6HYG 206
K8RTW 253	K1IXG 230	W4OM 204
W3LMA 251	WØUUV 230	G3DO 203
W5AFX 250	WØCVU 230	OE1RZ 201
VK3AHO 249	I1AMU 229	WØPGI 201
K2MGE 247		WA6HOH 200

CQ SSB ENDORSEMENTS AND CERTIFICATES

W8EAP 275	GM3JDR 175	KØMAS 100
W3LMA 250	K9PPX 175	K2KGS 100
K6MLS 225	W4OM 175	W2LLI 100
W1AOL 225	GM3JDR 150	K3BNS 75
VK3AHO 225	W4OM 150	K4FTY 50
W4OM 200	GM3JDR 125	VE2BCT 50
	K5YYI 125	

Two new trophy donors have been added to those already announced for the Seventh Annual *CQ* World Wide Single Sideband Contest scheduled for March 30-31, 1963. (See January *CQ* for full details.) Don Sleeper, W1ONK, will sponsor a cup to be awarded to the highest scoring DX station using single band operation while Chester Franz, WØNFA, has agreed to donate a trophy to the highest scoring DX station using under 175 watts p.e.p. on multiband operation. Both of these amateurs are well known to the fraternity as top operators and enthusiastic contest participants and we are pleased to have them with us as trophy donors.

With so many new sidebanders on the air these days, this forthcoming contest should be crammed full of activity. To the newcomers, we suggest that they check the rules very carefully and then take a few minutes at the start of the contest to observe how the seasoned contestants operate. Better still, get any questions you may have answered before the contest starts so that you'll be all set to roll up a good score.

Once again, we request that common sense and courtesy mark your operation. If the DX operator you're trying to work is using a transceiver, don't clutter up the frequency by incessant calling, prohibiting others to hear what station is being worked. If the pile-up is huge, move on to other contacts and give the DX operator a chance to whittle down the callers. Take advantage of the many bands at your disposal if you're a multi-band operator, and check propagation with WWV to make the most of current conditions.

Don't forget that there are many sidebanders who are not interested in contests. In the interests of fair play and harmony, don't allow your enthusiasm to spoil the weekend for non-contestants. There's plenty of room for all to pursue their own interests—let's not step on too many toes!

Remember that log sheets, *etc.*, are available from the *CQ* SIDEBAND Editors. Avoid possible disappointment by sending for your report forms as early as possible. Good luck to one and all and see you in the contest.

Quality, Not Quantity!

We are pleased that our suggestion for a new method of sideband signal reporting as outlined in our December column has brought many favorable comments. The system deviates from the normal a.m. practice in that signal strength is

Here's a young man who suddenly found himself thrust into a madhouse of amateur activity! This is Tore, LA9RG/P, who, using the LA6VC KWM-1, put Spitzbergen on sideband for the first time ever and on c.w. for the first time in many years. He was, and possibly still is, the center of some of the wildest pile-ups ever heard but must be a dedicated amateur and very good sport since he keeps coming back for more. *(Photo courtesy of Finn, LA6VC).*

*12 Elm St., Lynbrook, New York.

not considered; we feel that any signal report in sideband should place primary emphasis on qualities of readability, quality and suppression. We believe that signal strength should only be considered in the sense that it aids in the "readability" factor.

Under the proposed system, the following reporting symbols are to be used:

Readability
Q-5—Completely Readable.
Q-4—Readable With Little Difficulty.
Q-3—Readable With Considerable Difficulty.
Q-2—Barely Readable.
Q-1—Unreadable.

Audio Quality
S-5—Excellent Quality.
S-4—Good Quality.
S-3—Acceptable Quality.
S-2—Poor Quality.
S-1—Very Poor Quality.

Suppression
A-5—Excellent Suppression.
A-4—Good Suppression.
A-3—Acceptable Suppression.
A-2—Poor Suppression.
A-1—A.M.

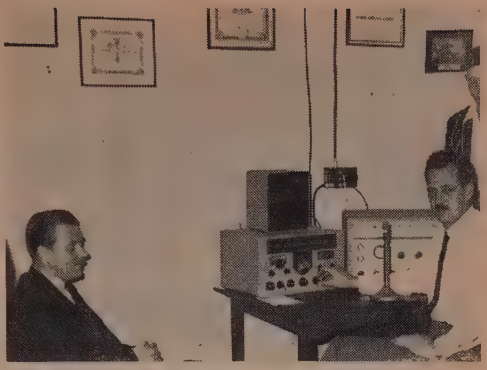
A logical question at this point is "Why do we need a new system of signal reporting? What's wrong with the old one?"

What's wrong? Everything!

The old system does not give an acurate "picture" of the received signal; if you will look at the RST System outlined in the ARRL Handbook you will see that the RST of c.w. describes almost completely the characteristics of the c.w. received signal. Why should s.s.b. signal reporting be tied to a system that does not adequately represent or describe the incoming s.s.b. signal? To say an s.s.b. signal is "5 × 9 plus 20 db" only gives a partial description—it says in effect that you have a very strong readable signal but it does not give any indication of its quality. The signal may, on the other hand, be distorted and have little or no suppression of unwanted sideband and/or carrier.

We hope you will agree that the time is here to begin giving more than empty reports on s.s.b. signals—more important than the quantity of "db over S-9" should be the quality of audio and the amount of suppression—the real reason for the superiority of s.s.b. If we do not preserve this superiority, we will have little justification for the use of s.s.b. in the future.

Ron Kilgore, WA4ACA, of Paris, Tennessee, was the first WA4 to appear regularly on sideband and provided a field day for WPX hunters. In the short time he has been licensed, Ron has made a host of friends with his big signal, cheery voice, and fine operating technique.



The Rand Hobbies Fair in Johannesburg, South Africa, in October included a sideband station operating under the call of ZS6RHF but, more important, gave us the long-awaited opportunity to bring you a photo of Attie Louw, ZS6AMV, (right) whose friends on 15 and 20 meter sideband are legion. Shown with Attie is Dennis Buckley, ZS6BFV.

Operation Rovan

Shortly before Christmas, sidebanders and other hams joined together in "Operation Rovan"—a spontaneous effort to repair the ravages of the earthquake in Iran. Sparked by Lyndon DeWitt, EP2AC, a 7th-Day Adventist missionary, and Dr. Ray Cook, W4JOH, now of Atlanta, Georgia, but a former teacher in Iran, hams everywhere forwarded contributions to Lyndon to rebuilt the village of Rovan as a monument to the cooperation and kindliness of the radio operators of the world. We hope that many of our readers participated in this operation. If you are reading about it for the first time in this column, it is not too late to forward your contribution, whatever it might be, to Lyndon DeWitt, The Seventh-Day Adventist Mission, 111 Pahlavi Avenue, Teheran, Iran.

Sideband Dinner Tickets Available

With March 26, 1963, drawing ever closer, here's another reminder that all sidebanders everywhere are invited to the fabulous 12th Annual Sideband Dinner and Hamfest at the Statler-Hilton Hotel in New York City. Preparations are going ahead full steam with the following SSBARA members as Committee chairmen: Dinner, Stan Rosenberg, WA2GFV; Treasurer, Irv Richter, W2IVW; Door Prizes, Mort Kahn, W2KR; Raffle, Larry Bargebuhr, W2FGZ; Exhibits, Irv Strauber, K2HEA; DX Luncheon, Dorothy Strauber, K2MGE; Publicity, Ed Piller, W2KPQ; Seating, Art Greenberg, W2CYK; and Tickets, Buddy Robins, W2JKN.

As many of you already know, this is an all-day affair from 10 A.M. to midnight and covers all phases of sideband operation—from the exhibit of the newest in equipment and accessories to the in-person good fellowship to a delicious full course steak dinner, and top notch entertainment. Tickets purchased in advance are $12.50 each and are available from W2JKN, 4665 Iselin Avenue, New York, 71, New York.

[*Continued on page 94*]

RTTY

BYRON H. KRETZMAN*, W2JTP

RTTY Operating Frequencies

Nets centered on frequencies given; operation usually ± 10 kc.

80 meters	3620 kc
40 meters	7040 kc ?
20 meters	14,090 kc
15 meters	21,090 kc
6 meters	52.6 mc

SPECIALIZED test equipment for radioteletype is especially fascinating to the RTTYer, because the RTTYer likes to *build*. While most of this RTTY test equipment is built from scratch, occasionally a piece of gear appears on the surplus market which can be extremely useful after only a little modification.

Such a device is the Philamon Labs Model TFD-18-500 Tuning Fork 500 Cycle Audio Generator. As supplied, the 500 cycle tuning fork must be shifted in frequency to 425 cycles. (For the benefit of the "unwashed multitude," RTTYers use frequencies which are multiples of 425; *i.e.*, 850, 2125, and 2975 cycles.) This is a nice compact unit 3¼ × 3½ × 2 inches in size. Tube, tuning fork, resistors, capacitors, *etc.*, are all self contained. All that is required to operate the unmodified unit on 500 cycles is an external source of 28 volts d.c.

*431 Woodbury Road, Huntington, New York.

RTTY The Hard Way...No. 16

"Fred has taken over my spot in the net since I've had trouble reaching the keyboard."

W9SEH Tuning Fork Oscillator

Mac, W9SEH of Urbana, Illinois, has come up with the detailed information on this item. Figure 1 shows the diagram of the unmodified unit. It had a 5814A, which is similar to the 12AU7 except for the higher heater current. Mac converted to 6.3 volt heater operation with a separate plate supply.

Begin modification by removing the cover and shield plates and unsoldering the two wire leads to the fork container. The fork container is then removed by taking off the nuts and washers from the bottom. After taking out the tube, it will be noticed that pin 9 is missing on the socket. Take a socket pin from another 9 pin socket and put it in the hole provided. On the terminal board, remove the lead behind the board that connects terminals 1 and 4 together. Connect a piece of #20 hookup wire to 4, which becomes the 6.3 volt terminal, and solder the other end to the new pin 9 on the tube socket.

Disconnect the red lead and the lead of the 39K resistor from pin 5 on the tube socket. Solder these two leads together and dress back so that they will not short to the chassis or to the cover plate when it is replaced. Complete the heater circuit rewiring by soldering a short jumper from pins 4 and 5 on the socket to the nearby ground lug.

W9SEH Tuning Fork Audio Generator.

Fork Modifications

The sealed fork container is not difficult to open. (Save the rubber band.) Begin by drilling, with a #43 drill, an air hole in the top, away from the terminal end, and between 3/16" to 1/4" from the end. Clamp the fork container in a vise and with a torch gradually heat the seam around the top; and, using a hook of steel wire through the drilled air hole, pull off the top of the container when the solder melts.

The next step is to make a pair of weights for the fork tines to bring it down in frequency. A piece of 1/8" brass strip 3/8" wide and about 2 or 3 inches long should be procured. A hacksaw is used to make a slot about 1/16" deep in each end of the brass strip. Try to center the slot between the two 3/8" faces. The weights are then made by sawing off a 3/16" piece from each end of the brass strip. Use a thin flat jeweler's or pattern maker's file to widen the sawed slots so that they are a force-fit over the ends of the tines. Clip the two weights onto the tines.

Reconnect the fork container to the assembly and apply 6.3 volts to terminal 4, 40 to 50 volts to terminal 2, and ground to terminal 1. Fire up and check the frequency of oscillation. The frequency should be *below* 425. If it isn't, the brass weights are too small. By removing the weights and filing the unslotted ends, raise the frequency to 429-430. Take it easy here. Better to take the weights off and on several times than to go too far. Now solder the weights to the tines. The weight of the added solder should bring the frequency to about 425 cycles. Final move to frequency is made by filing away brass to raise or by adding a little solder to lower. When the fork is on frequency, replace the fork container cover and solder in place, replacing the rubber band, covers, and shields.

Project DESPAIR

As we announced last month, at long last printed circuit boards have been made for the W2JAV transistorized TU and the transistorized a.f.s.k. oscillator. Briefly, these boards are available for $1.50 each, postpaid, from your RTTY Editor. See last month's RTTY COLUMN for the details.

On the Bauds

W1ZGK of Branford, Conn., is on 80 with 100 watts and tape gear. W1OUG of Stamford, Conn., has been working W9AC/OA2 aboard the hospital ship S.S. *Hope*, working 20 in the mornings. W1TLZ is on 80 from Norwalk, Conn. W1BGW, former NCS of the East Coast net is operating on 7140 kc. W2PBG, formerly of Bayside, is back on from Huntington, N. Y. after a 2 year lay-off. WA2HWJ wonders who the youngest RTTYer might be (Jack is 15). W2ZKV of Elmhurst, N. Y., has Model 26's for sale at $75 each. W2JAV is on the Southern N. J. net on 146.7 mc a.m. Monday nights, a.f.s.k.

W3LST of Oil City, Pa., is on with a KWS-1 and a Model 19 and has up for trade an O-5B

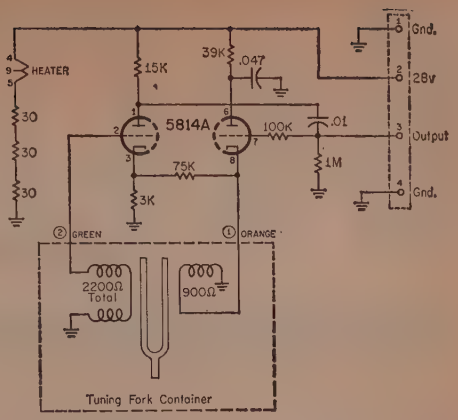


Fig. 1—Philamon Labs Model TFD-18-500 Tuning Fork 500 Cycle Audio Generator Schematic Diagram.

f.s.k. exciter. W3DTH of Oreland, Pa., NCS of the EC F1 net, is now on a.f.s.k. on 146.7 mc a.m., working into the Southern N. J. RTTY Net on 2. W4EGY of Lake City, Florida, is NCS of the FREN on 80. W4BLK of Oxford, N. C., is also on 80, pouring a good signal north. W5CME of New Orleans, La., is working 20 with a kw signal. K6ESZ of Richmond, Calif., OBS of the NCARTS, was flooded out in October but is back on the air. K8IJL of Detroit, Mich., is on 80. K9CNG, 839 North Sixth St., Vandalia, Illinois, has polar relay sockets available for 75¢ each.

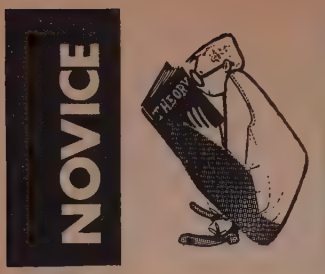
DL4IA is on 20 from Baumholder, Germany, copy good to W1OUG in the mornings. G2UK is building a 'scope tuning indicator from the *New RTTY Handbook*. KH6DUB is /KL7 and has a Boehme 5-C converter. VE2HY of Montreal was heard using narrow shift on 7140 kc with VE3CM of Toronto.

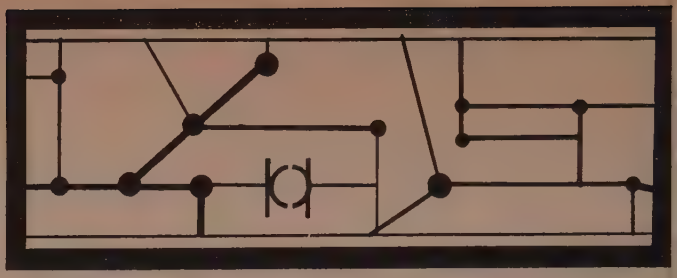
Comments

In the November 1962 RTTY COLUMN we asked how come we never heard any RTTY on 7040 kc. (All operation we hear is around 7140 kc, in spite of the listing of 7040 in *QST* and *CQ*.) We have had quite a few comments about this. If you would like to join in, drop me a postcard. We will then print a few, and in the meantime will try to find out how this came about.

73, de Byron, W2JTP

W3CRO (left) and W8LEX at CATS Meeting.





NOVICE

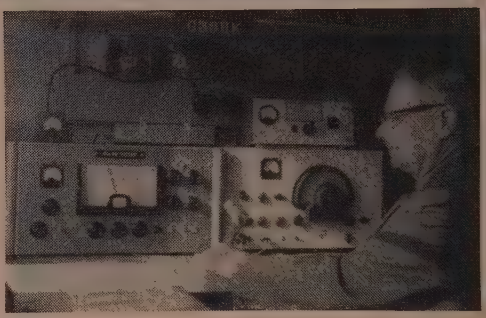
WALTER G. BURDINE*, W8ZCV

THIS column begins the second year of my second term as your NOVICE conductor and I wish to extend my thanks to all of the people that have taken time to write and send pictures to make interesting reading for the newcomer and the Novice aspirant. It takes a lot of time for many people to put out a magazine that will have something of interest for all. We just can't all be interested in the same subject so we must cover many subjects with something for all. Your letters have given me ideas for articles covering a good many subjects, some of which are in process of becoming a reality now and soon will be in NOVICE for your construction. I want to thank all those who took time to write me personal letters of condolence, to offer help, to offer equipment for other novices and to offer advice and aid for the future radio operator. It would really do well for you to read some of the letters that I never print for one or another reason.

Again thanks to you the reader for your help. Let's all get on the ball and make 1963 a year to be remembered for ham radio. Write me letters and send pictures, give me ideas for furthering the cause of amateur radio and I will try to put it in form to use. If I publish a construction article, you can be sure it has actually been built and used here at W8ZCV and usually a number of local hams have built it and had no trouble. The projects *will* work and as specified in the article. I will at all times try to build these as cheaply as possible and with as few special parts as possible; don't let me forget that my readers mostly are beginners, therefore usually limited in a number of ways, they are often young folk still in school and time, money and effort are important factors to remember. I will at all times try to keep this factor foremost in my planning for the column.

I am a firm believer that to be a good all-around amateur you must do some construction work on your amateur station. I think you learn and retain knowledge better when you actually construct an item for your station. Then there is always the pride that a fellow gets from building a piece of gear. Co-op schools are proving that the best way to learn is by doing, although this is actually becoming the most expensive way to get on the air because of the low resale value of home built equipment versus kit built or commercially built equipment. Building a kit is reasonably inexpensive and if the work is completed as per instructions, the results are comparable to more expensive commercially built stations, with the experience and pride thrown in for good measure. No matter how you do it, get on the air and enjoy your amateur radio experiences.

*R.F.D. 3, Waynesville, Ohio.



Hector Cole, G3OHK, 25 Causeway Road, Seaton, Workington, Cumberland, England is still reading CQ, and appreciates his amateur radio. He says "Get a thing easy and you never appreciate it." Read his letter.

CHC/HTH 1963 Annual QSO Party

Clif Evans, K6BX, that ole certificate man from Bonita, California sent me advance news of the CHC/HTH QSO party and it looks real good to me. He added a note that it was open to all Novices and Technicians, so lets show him that we can win as well as anyone with more power. The time will be 2300 GMT, May 31 thru 0600 GMT June 3rd, 1963. This is advance information, a sort of a sneak preview so that you can get your equipment in good shape for the contest and I have a idea ole W8ZCV will be in there with you on all bands.

You might read all about this party in Clif's column in *CQ* and by the way his Certificate Hunter's Club bulletins has an enormous amount of good dope in it. Read his column and write him for any information pertaining to certificates if it isn't in *CQ*.

The material written by James J. Howard and Sgt. Bill Gardiner for the publication that is furnished to all members of the American Short-

wave Listeners Club, 6204 East 109th Terrace, Kansas City 37, Missouri is worth the small membership fee. Too darned bad that you will join too late to get Bill's article on cleaning up your receiver. The ASWLC has a program over WRUL every Saturday from 1830 to 1845 GMT on 15.385 and 17.810 mc. Listen in, they give a lot of ham news as well as short wave information.

F.A.R.M.S.

"Bill" Povey, KN3SPO, 8 Franklin Street, Feasterville, Pennsylvania informs me that 12 young people from his church are attending radio classes at Warminster taught by George Jackamonis, K3JRD and have organized themselves into the Feasterville Amateur Radio Missionary Society (FARMS.)

Anyone wishing help from or for them may contact "Bill" at ELmwood 7-0338. Does anyone in the area have classes for the general? Four members have already passed their Novice test and they are hoping to get a call for their club soon.

This seems a good way to give subsistence to the efforts of this group of young folks. Bill says they are mostly high school students and and therefore have limited finances, but they are collecting dues and building towards a good station.

The Grid-dip Meter

The most versatile instruments on the workbench is the grid-dip meter. The grid-dip meter is a low powered oscillator equipped with a sensitive meter in the grid circuit. When the low-powered oscillator is resonant with an external tuned circuit, power is taken from the tank circuit of the grid-dip meter and the grid current of the oscillator tube takes a suden dip. This action gives the grid-dip meter its descriptive name. Of course if the oscillator element is a transistor, the name is a misnomer.

Grid-dip meters are usually constructed as compactly as is possible with a fair degree of accuracy and stability so that it can be used in close quarters such as is often found in receivers and transmitters. By making these small the dial cannot be accurately calibrated but is often only used to get you in the ball-park. However, if the dipper is beat against an accurately calibrated receiver or heterodyne frequency meter, the unit can be depended upon to give accurate frequency indications of the resonant circuit in question.

The dipper can often be used as a crystal oscillator by removing the coil and substituting a crystal. This signal can then be tuned in on the receiver at the indicated crystal frequency.

The *Q* of a circuit can be judged by the depth of the dip as the dipper is tuned through resonance. The low-*Q* circuits are indicated by a shallow dip when loosely coupled to a resonant circuit, high-*Q* circuits produce a sharp dip.

The wide frequency range of the grid-dipper can be used to check for unwanted resonances in transmitters that might cause TVI by using it as a wavemeter and tuning for an indication while near the transmitter under test.

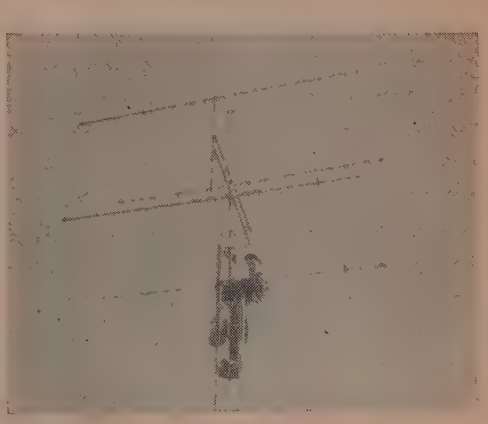
Most grid-dippers can be used to measure inductance and capacitance as used in r.f. circuits. They usually have a chart for determining these values when calibrated against an arbitrary standard as specified in the instructions.

By the correct usage of a grid-dipper a transmitter or receiver can be pretuned before applying power to the unit. All coils can be set near their operating frequency, saving lots of time and effort.

The dipper can also be used as a phone monitor by placing the function switch in the DIODE position and plugging an earphone into the jack provided. It can be used as an indicator for checking neutralization in a transmitter while the detector is in the diode position or can be used as a simple field strength meter for tuning the transmitter for maximum power output. The switch is placed in the DIODE position for this test.

These are but a few of the uses of the grid-dip meter and I'm sure you will be pleased with your instrument when you get acquainted with it. No ham can afford to be without a grid-dip meter. All of the handbooks have a chapter or two on this important test equipment and circuits can often be found too. Kits are put out by many kit manufacturers and the completed instrument can be bought from most radio supply houses. I have two Heath-kit GD-1A Grid-dippers here, by the way.

[*Continued on page 98*]



It's all in the way you look at things. Here is a worm's eye view of that ether-bustin' 2 meter antenna of Virda Hiles, K8TKL, Dayton, Ohio. I know you've already worked him. Virda was licensed as 8UX August 12, 1915 at Blair, West Virginia and later as W8ATT. He let his license lapse during the war and moved to Dayton. Virda says that the ham-bands didn't interest him after the war since a new kind of operator was spawned by the war. He says, Through the good graces of W8ZCV, I got a diagram of a v.h.f. converter that he swore by. Sure enough it worked and so I got the ticket back." Virda is a Tech that we can all be proud of. His wife Garnet was the first licensed YL in W. Va. as W8RFT in 1934.

the USA-CA PROGRAM

CLIF EVANS*, K6BX

TEN more lucky winners have bagged the beautiful and colorful USA-CA Award bringing the total for USA-CA-500 and USA-CA-1000 winners to one hundred and fifty six. Latest winners were:

USA-CA-500

W1HGT	139	K5MWV	142	K4GLA	145
XE1AE	140	K8ZCG	143	WØBBS	146
W9HUF	141	[illegible]1ER	144	W4EJP	147
				K8QYG	148

Of the above, six were for mixed operations, three were all phone, and one for c.w. To those hunters who haven't yet looked over the "unlimited fun" and tremendous scope of the USA-CA Program which fits and satisfies a great variety of individual tastes, we suggest you check March, 1962, issue *CQ* for full rules and July issue 1962 for full page picture of this 14" × 21" awards masterpiece. If these copies aren't available or you'd like special copy of the USA-CA rules, send K6BX an s.a.s.e. and we'll send along as much awards literature as the envelope will hold.

We Get Letters and Questions

Dean, WAØDLG, ". . . am in the Far East and am avid *CQ* reader. A rousing 'Well Done' for USA-CA . . . fully concur your October letter to the Editor *CQ* on subject of phone patching. Why not devote a Department in *CQ* directed toward the military reader? I think it high time we start improving relations between the military and the civilian ham." OLD MAN'S comment: We can only agree relations are suffering an need some 'prop'. We suggest ample improve ment would occur automatically if the brass d the military were awakened to the fact that th amateur radio bands belong to all nations equall and for civilian use exclusively. Military person nel enjoying amateur privileges are supposed t be doing so in a 'civilian' or 'off duty' status Today, semi-military and commercial-like phon patch traffic with a continuous and obnoxiou "overseas military phone patch traffic—clea channel please" drives ten of thousands of civ ilians off the bands and creates much ill will. No until these 24-hour a day semi-military station shift their somewhat illegal traffic to MARS fre quencies can there be hope of good will rappor re-established among the majority.

Clyde, WA9AJF, "I am prompted to tell yo and *CQ* that USA-CA is the most interesting an challenging hamdom program of the day . . continued success to your seemingly tireless effor in behalf of the Amateur Radio World."

PY1AVP, Newton L. Caldas, Rua Soa 72 Apt. 202, Tijuca, Guanabara, Brasil, "I learne from *CQ* of your many Good Will programs an help to others . . . I am 17-years old and in 10t grade. I urgently want to study Electronics Engi neering in the U.S. I am a fine boy . . . do yo think some family would sponsor me to exter of room and board . . . this is my most importan need as my family will help and I will work t earn my keep. You know so many folks . . . coul possibly one of them be interested in helping m attain my educational goals."

*United States of America Counties Award Custodian, Box 385, Bonita, California.

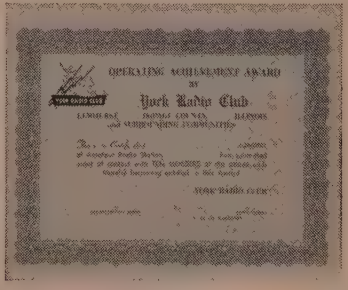
The big smile on the left is John C. Kanode, K5UY being presented his Arne Trossman, CHC-200 To Honors Plaque at a Chamber of Commerce speci luncheon, Albuquerque, New Mexico. Making the pre entation was President of the C of C, Charles Lanie To win the Arne Trossman Plaque, one must first achiev CHC-200 by winning at least 200 amateur achieveme awards and merit credits. John is a 'spark plug' in th highly active New Mexico CHC Chapter No. 1 whi sponsors the annual New Mexico QSO Party with e phasis on supporting USA-CA. This group also sponso the Work New Mexico Counties award, supportin USA-CA, and the Amigos De Albuquerque award.

Pictured here is the multi-colored King Cotton Award sponsored by the Mid-South Amateur Radio Association, Memphis, Tenn., for working Memphis, Tenn., stations after June 1, 1961 under following conditions; any Shelby County station counts; Shelby County stations work 25; U. S. stations work 15; others work 10. QSLs must be exchanged if Memphis stations want cards. Send log list only and 50¢ or 4 IRC to Custodian, Bill Egbert, 761 University, Memphis 7, Tenn. Award is in red, green, yellow and black. Endorsements all one mode/band or mixed.

PY4AP, Bin, "Cliff, OLD MAN, I am highly interested in USA-CA and the many awards listed in your *CQ* column which accept GCR. I am soon to be a CHCer. On GCR, have DXCC 116/104 mostly on 7 mc but have not applied. Your ARRL demands cards be sent as proof and does not accept GCR. Here in South America, the risk of losing batches of QSL cards in the mails is too great. Tell me Cliff, why do some U.S. sponsors still demand cards be sent and motivate others to retaliatory action?" OLD MAN's note: Bin points up a sore point of U.S.-created ill will on a world-wide basis. GCR or General Certification Rule simply state an awards sponsor will accept as reasonable proof of possession of necessary QSLs a signed certification by two other licensed amateurs or one officer of a recognized radio club or organization which states cards have been sighted and are in accordance with list presented. GCR also provides that a sponsor may for any purpose whatever, request any and all cards be sent if question arises. In all other areas of our human society, *except amateur radio,* one can have practically all legal, civil, government or business transactions duely certified by responsible persons. The reason for this is that under civilized mores, laws and codes, folks are considered honest under oath and under systems of acceptable certification. Most nations provide their nationals with amateur radio certification service. Most nations strongly desire there be reciprocal certification systems and processes between nations. To all appeals for such reciprocal certification processes, our League has given a flat *no.* We will not, at this time go into the internal PR reasons of ARRL's refusal to accept any form of GCR; suffice to know is that the situation exists and is breeding ill will world-wide. The OLD MAN opines that sponsors of awards who refuse any and all systems of GCR are guilty first; of a dis-service to those they presume to serve by forcing them to needlessly pour tens of thousands of dollars down a ridiculous rat hole; second, they create the needless situation wherein too frequently other lose valuable (to them) batches of QSL cards in the mails. More important than the foregoing, by denying any system of certification, such sponsors set themselves up with Devine-like police and judicial authority and powers to sit in moral judgment over their fellow men under an atmosphere that all hamdom is prejudged a bunch of cheats, and with a police action system to prove it. Until U.S. hams prevail upon the 'authorities' of ARRL to provide reasonable certification system either directly or through affiliated clubs, other nations will, reluctantly, respond with retaliatory 'reciprocal' treatment. Here is another classic example wherein an internal League policy in support of own awards programs constitutes a dis-service to world hamdom.

Rus, W4ZXI, "Cliff, I've just returned from overseas where I was denied the privilege of hamming because my own country so far refuses reciprocal licensing . . . those many months overseas I read USA-CA with high interest and eagerly awaited the day I could join such unlimited fun. I'm back and the fun has already started . . . please do keep plugging for reciprocal licensing."

Joe, W5BQZ, "Cliff, can a General use cards received as a Novice at another QTH toward USA-CA." Comment: Yes, unlike some 'popular' awards which are issued to street numbers, USA-CA is issued to the individual for his personal achievements regardless of class license held, or call held, or change of QTH whatever. In the old spark days when folks lived and died in the same old home town, it was considered, because of the short range of spark sets, that a fellow who changed QTH obtained some advantages. Today with unlimited communication potentialities in equipments, and in an atomic space age where folks are continuously on the move as a normal function of society, it is somewhat ridicu-



Above is award by the York Radio Club, Elmhurst, DuPage County, Illinois for contacting 10 members after January 1, 1962. The award pictures an Elm tree leaf for which the city is famous. The award is signed by Custodian Clyde Bidgood, WA9AJF and the city Mayor, Charles Weigel, Jr. Active members are: W9ARC, AEN, AEZ, AQJ, BMC, CIB, CWL, DDX, EQF, FKF, HXE, KQT, LXV, NAB, NNE, OJI, OKI, OKS, PNB, PYG, PXW, RFS, UIW, UMD, YLI, WEE, WKM, YAC, YFV, ZAB, ZYL; WA9AJF, CML, APZ, AST, AWY, BQN, DLX, WN9AJD, AJE, ALO, AQG, CSA, CBF, CCJ, EOX, FSU, K9AJN, IFE, FRW, GNR, LOS, OVI, QII, SCP, UQJ, VBB, VGN, VGT, WOJ, YJR, ZFU, ZXB, KN9FJL, FRN, FSX.

Here you see Clayton Elam, K4ZJ, President of Mid-South Amateur Radio Association, Memphis, Tennessee, holding copy of newly sponsored Worked Tennessee Counties Award. (See pics this award and King Cotton award) Gent in center is Pete Goodwin, WA4BNL, first ham to win the King Cotton Award. Fellow on right is Bill Egbert, K4JIG, Custodian M.A.R.A. awards program.

lous that folks are denied all but 'home town' QSL credits. We have for many years considered awards with 25-mile limitations as too ridiculous to merit our interest. What do you think?

Geo. WA4FGX, "Cliff, as just another ham, let me add my thanks to you for putting new interest and life into ham radio with your many programs. I see you are QCWA. I would like to compliment QCWAers as being among the best QSLers."

C. J. Muller, HK3VV, "Wish to congratulate you and *CQ* on the most valuable attributes of the USA-CA program . . . for DX operators like myself, it has renewed interest in working W/K amateurs, and in doing so, it has definitely contributed to a better and closer understanding, on our part, of your people and your country. For this I thank you. Please keep up your crusade asking W/K amateurs to name countries on QSLs, and for those in Independent cities to name adjacent counties. This information means much to DX stations."

USA-CA P.O.D. #26 Good Will Program

You all know about OLD MAN K6BX's *Call Book* Good Will Program which now has seen over 5000 'replaced' *Call Books* sent to DXers who otherwise could not possess one . . . well, here's a 'companion' Good Will Program of tremendous help to DXers.

CHCer Kaz, K2ZRO, now with over 150 awards to his credit just gave 'us' the brain-child. Says Kaz, "Went to local Post Master, explained the *Call Book* Good Will Program, told him the replaced P.O.D. #26 publications destroyed by the P.O. were urgently wanted by DXers all over the world, and how about it?" Kaz said he came away with six P.O.D. books with promise of same each and every year as such books are reprinted under July 1 date each year. As Kaz said, "All U.S. Post Offices discard one to a dozen of these valuable books each year, and they are to be had for an intelligent asking." Fact is, you can now tell the PM's they are for the *established* USA-CA P.O.D. #26 Good Will Program.

Right here and now, the OLD MAN creates the USA-CA P.O.D. #26 Good Will Program with K6BX acting as Administrator. DXers who desire the gift of an expired issue P.O.D. #26 may register with K6BX. U.S. and Canadian hams may send s.a.s.e. to K6BX requesting names of DXers who specifically have asked for such gift . . . as simple as that. Okey gang . . . it's your show, and the show is on the road . . . right now!

NOTE: The P.O.D. #26 listing all U.S. cities and associated counties has gone up to $2.50 rather than previously announced $2.25. The above Good Will program also includes other publications and Atlas books serving similar need as P.O.D. #26.

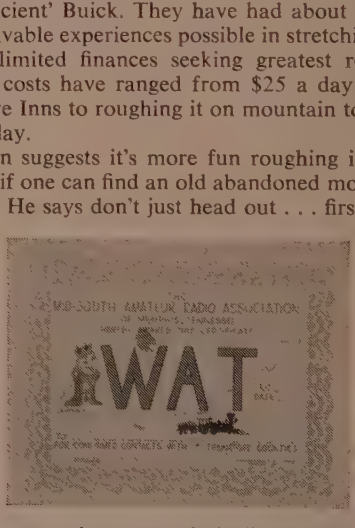
Head For The Wilds—Vacation or Field Day

There is 'unlimited fun' in combining ham activities with many other pleasure pursuits. Many today are combining Field Day and county expedition trips with planned holidays, picnics and excursions into the 'wild'. The advent of USA-CA provides unlimited opportunity to seek out 'rare' spots and 'uninhabited' areas productive of exciting 'pile-up' experiences. The many letters we receive show more and more fun and nature loving folks are heading for the 'blue yonder' seeking unforgetable and exciting experiences . . . guess it's that 'New Frontier' challenge.

Letters from Alan, K8ITH, prove that even W3 and W8 lands abound with exciting adventures to 'rare' counties. He and group of High School teenagers already have given out close to 2000 contacts to five continents and thirty-one countries primarily from 'rare' Forest County, Pa., and Monroe and Carroll Counties in Ohio.

The Alan group head out with gear loaded in an 'ancient' Buick. They have had about all the conceivable experiences possible in stretching out their limited finances seeking greatest returns. Their costs have ranged from $25 a day at expensive Inns to roughing it on mountain tops for $2 a day.

Alan suggests it's more fun roughing it especially if one can find an old abandoned mountain cabin. He says don't just head out . . . first scout



Here you see the new Worked All Tenessee Counties Award sponsored by the Mid-South Amateur Radio Association, Memphis, Tenn., for working 25 Tennessee counties after Jan. 1, 1955. Endorsement for 50, 75 and special award for all 95. Band/mode endorsements available. All *Directory of Certificates* rules apply. Send certified (GCR) list and 50¢ or 4 IRC to Custodian, Bill Egbert, 761 University, Memphis 7, Tenn.

area of interest and seek out sympathetic local habitants who usually know whereabouts of serted huts on hill tops. As example of one ch lead, Alan said they hit the 'ideal' atop a emendous hill in Monroe County where their watt six meter rig pinned S-meters as far away Pittsburgh. Most important Alan says, is to an trips well in advance so announcements can made especially over K6BX's CHC weekly ews sked, 2200 GMT, 14075, Sundays.

Alan says that his group has shown that even th limited time and finances, club groups can joy unlimited fun with continued interest. The oup now plans activating several 'rare' coun- s simultaneously.

HC & FHC Change Convention Location

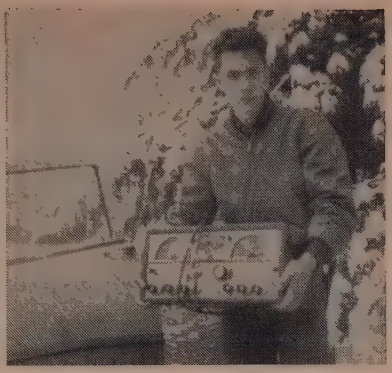
The Certificate Hunters' Club and the Flying ams' Club had previously announced tentative ans to hold joint Conventions at and within the ayton Hamvention, in April, 1963. Because of satisfactory accommodations available at Day- n, CHC and FHC have changed Convention cation to the Mid-American Convention, leveland, Ohio, October 4th, 5th and 6th, 1963. ctually four Conventions will be present as this so is site of ARRL's National Convention, 963. Fortunately, Cleveland has outstanding commodations to serve all.

CHC now growing two new members daily s over 850 members and four new chapters. hese are Germany Chapter #10, Indiana Chap- r #11, San Diego County Chapter #12, and ichigan Chapter #13.

diana Joins USA-CA Fun Unlimited

The Indiana CHC Chapter #11 has kicked off triple awards program by sponsoring the

tured here is membership and award number one r the Short Wave Listeners' Certificate Hunters' Club, on by Nathan Rosen, W2-6893. Second s.w.l. to join VL-CHC was Helmut Urban, DMØ-700-J, East Ger- any. The SWL-CHC was founded January 1, 1963 by e *Directory of Certificates and Awards* published by BX/WPE6OJ. S.w.l.s and radio amateurs may join VL-CHC. To join, one must possess at least 25 nateur radio classification achievement awards (as ted in the *Directory)* on a heard basis. The mem- rship certificate is 11 × 14" with gold background d has provisions for up to 6 gold 2" imprinted seals nifying holder has won 25, 50, 100, 150 or 200 ards, awards from at least 25 different countries, d awards from all 6 continents. The tough require- nts were intended to make SWL-CHC one of .l.dom's top honors. Life membership in SWL-CHC given for initial $1 fee. No dues; no assessments d later achievement seals are free. For further in- mation on SWL-CHC, write to Sec'y SWL-CHC, Clif ans, K6BX/WPE6OJ, Box 385, Bonita, California.



Here you see Alan, K8ITH, member of group High School teenagers, unloading ham gear from their 'ancient' Buick, preliminary to setting up Field Day station on a mountain top in 'rare' Forest County, Pa. As Alan says, "It was fun unlimited and the pile-ups we experienced whetted appetite for many, many more such trips into the 'wilds'." See text for complete story.

Worked Indiana (counties) Award, WIND, together with two others, The Ohio River Award ORA, and the Worked Evansville Award, WE, rules of which follow:

Worked Indiana—Work Indiana counties as follows and at least 5 contacts in Vanderburgh County; all contacts after Jan. 1, 1946; Class AA, special endorsement & award for working all 92 counties, and *extra*-Special for first station to qualify; Class A, work 70 different counties; Class B is 50 and Class C is 35. No endorsements for band/mode. Each a separate award but lower classes may be skipped. Send certified (GCR) list. Charge; W/K is 50¢; others 25¢ or 3 IRC. Custodian, Don Cox, W9LXW, 2912 Madison Ave., Evansville 14, Indiana.

The Ohio River Award—Work stations in counties of states bordering the Ohio River after January 1, 1946, as follows: Work 3 stations in one or more counties that border on the Ohio River in each of the following states of Indiana, Ohio, Penna., W. Virginia, Kentucky and Illinois. One station must be located in Vanderburgh County, Indiana. (total 18 contacts) Award issued in one class only; no endorsements. Apply as above.

Worked Evansville Award—Work stations located in Evansville, Indiana or having Evansville mailing QTH as follows: Evansville stations work 25; 50 U.S. states work 15; others 5. One Class only; no band/mode endorsements; submit log data list only for local check. Apply as for WIND award above.

A well done the this new CHC Chapter for really putting Indiana on the map.

Tennessee Joins USA-CA Fun Unlimited

Some time ago we alerted you'd get not only a Tennessee county award but a King Cotton award . . . well, here they are and what beauties to behold with their multiple colors our photos can't show. CHCer Bill Egbert, K4JIG, was spark plug behind creation of these awards.

That's the word for this month mates, so clear decks for ACTION. The OLD MAN, K6BX

VHF

DONALD L. STONER*, W6TNS

SOME time ago, a reader wrote to ask, "Why bother with transistor v.h.f circuits? Everyone knows transistors don't work as well as tubes." Our misguided friend apparently never constructed a two meter preamplifier using the Philco MADT T-2029 which exhibits performance right along with the highly touted Nuvistor. These devices (and their new 2N number which escapes me at the moment) are guaranteed to have a noise figure approaching 3 db at 144 megacycles.

Transistors can be fun! To prove the point, our feature this month is a completely transistorized handi-talkie for 6 meters. It uses only five low-cost transistors and is powered by an inexpensive battery. Three inexpensive MADT transistors are used in the receiver and transmitter circuits in conjunction with a two-transistor modulator/amplifier.

How It Works

The circuit for the 6 meter handi-talkie is shown in fig. 1. The detector, Q_1, a Philco 2N1499A operates in a degenerative mode and has a gain well over a million in addition to near perfect a.v.c. Resistors R_1 and R_2, R_3 and R_4, determine the operating point for the detecto Resistor R_4 is made variable to control super-r generation. The receiver is tuned by varying C which changes the resonant frequency of L Audio output from the detector is coupled to th amplifier via transformer T_1. A quench filter co sisting of C_2, C_3 and R_5 prevents the high fr quency quench signal from overdriving the au plifier. The antenna is transferred from th receiver to the transmitter by means of one se tion of a 4p.d.t. slide switch. The transmitt section consists of a crystal controlled oscillat (Q_2, a Philco 2N1499A (MADT), driving common emitter power amplifier, anoth MADT-type 2N1749. The oscillator is cryst controlled by means of a fifth overtone "rock Tuning is accomplished by C_4 in the oscillat and C_8 in the power amplifier. Drive from th oscillator is coupled to the final by C_5 which ac as a capacitive voltage divider to impedan match the two stages. The final operates class and provides a power gain of 10 db at this fr quency. Efficiency is approximately 50% sin the stage delivers about 25 milliwatts with a d input of 50 milliwatts.

The amplifier/modulator is a two-stage R circuit employing two 2N224 transistors (Q_4 a

*Alta Loma, California.

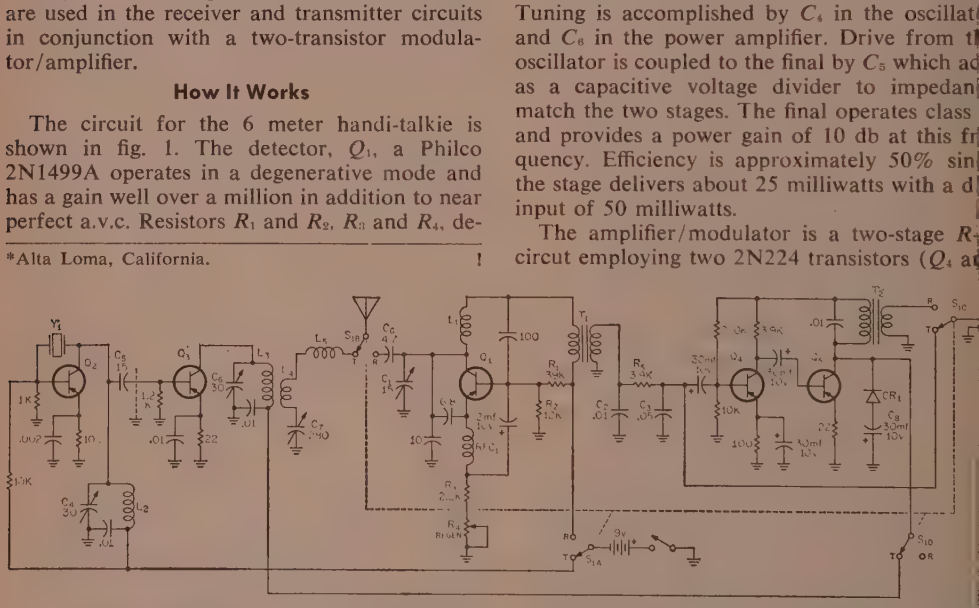


Fig. 1—Complete schematic of a six meter handie-talkie. All resistors are ½ watt. All capacitors greater than o are in mmf and less than one in mf unless otherwise specified.

C_1—15 mmf variable, Hammarlund MAPC-15 with 4 plates removed.
C_4, C_6—4-30 mmf trimmers.
C_7—280 mmf compression trimmer. ARCO #464.
CR_1—1N34A diode or equivalent.
L_1—10 t. #16e. ⅜" i.d.
L_2, L_3—8 t. #16e. ⅜" i.d.
L_4—2½ t. #20 plastic hookup wire over L_3.
L_5—9 t. #20 plastic hookup wire ¼" i.d.
Q_1, Q_2—2N1499A.
Q_3—2N1749.
Q_4, Q_5—2N224.
R_4—5K miniature pot. Regeneration control.
RFC_1—6.8 μh choke. Ohmite Z-50.
S_1—4 p.d.t. push-button switch. Lafayette SW-92.
T_1—Transistor driver transformer 20K to 1 K. Argon AR-104.
T_2—Transistor output transformer 1 K to 3.2Ω. Argon AR-138.
Y_1—5th overtone 6 meter crystal.

C_5). A small portable radio speaker is used normally on receive, and as a dynamic microphone when transmitting. The final is Heising modulated at a level of about 90%. Diode CR_1 and capacitor C_8 protect the final amplifier and act as a form of speech clipper. A 4p.d.t. slide switch serves to transfer the circuits between receive and transmit.

Construction & Operation

No particular construction details other than coil winding data is given. The circuit layout should not be critical although the conventional practice of very short leads in the receiver and transmitter section should be observed. The unit can be completely self-contained in a $5\frac{1}{2} \times 3 \times 2\frac{1}{8}$ aluminum minibox. The compact nature of the receiver would lend itself to printed circuit techniques for the ambitious constructor. The receiver should be shielded and a small shield plate should be used between the oscillator and final amplifier in the transmitter. Regeneration is controlled by varying R_4 and it should be adjusted, along with C_1, for best reception. The transmitter should be peaked up by tuning C_4, C_6 and C_7 for maximum field strength. Loading coil L_6 can be adjusted for maximum field strength by spreading and compressing turns. On receive, the battery current should be approximately 15 ma and on transmit, the current should be approximately double this figure.

Our thanks to Philco-Lansdale for this information.

VHF Around the World

Terry Brown, VK2ZBL fills us in from "down under". He says, "Quite a few of the v.h.f bugs, myself included, are now happily (?) pursuing the gentle art of sideband (double and single) right up to 576 megacycles. The 576 band of ours, incidentally, is taking the 'deep six' at the end of next year and will be replaced by a 432 mc allocation. This should make multipliers to 1296 a little easier. Anyhow, getting back to sideband, we are having some pretty unusual breakthroughs at odd times on 2 meters to place like ZL, VK4, VK5, 7 and 9. The old DX bug is hitting some of us pretty hard. Hence, the frenzied activity, with about 90% preparing to run the 'Aussie gallon', which as you know, is only 150 watts. Still, you never know your luck.

"Current project on the boards here is a 6 and 2 meter s.s.b. rig using a sideband package described by you for use with the McCoy filter, then to a 5763 mixer, followed by 6360 driver linear, and on to a QQE06/40 double tetrode in ZL linear configuration, (also from *CQ SSB Handbook*), which is working out just fine. However, no McCoy filters are available 'over the counter' yet, so I've had to make do with a full lattice, using FT241A crystals. Well, that's it, except to tell you that the v.h.f. articles in *CQ* are real fine, particularly the meaty ones with plenty of schematics."

The new Lafayette HE-56 Six Meter Converter

New Products

Lafayette Radio has just announced a new series of converters for the 2 and 6 meter bands. Both the HE-56 for 6 meters and the HE-71 for 2 meters have a 7-11 mc i.f. and self-contained power supply. Sensitivity of these converters is better than one microvolt and they employ self-contained power supplies. The HE-56 is priced at $29.95 and the HE-71 sells for $31.95. For more info, drop a line to Lafayette.

Who's News

From up Connecticut way, our Waterbury reporter, Walt-K1RTS, advises us his club is converting RT-19/ARC-4's to 2 meters as a group project. They should have about six ready to go soon but are having trouble getting the receivers to fire up. Walt says, "Both *CQ*, Nov. 1955 and the *Surplus Conversion Manual* insist on putting a mess of jumpers on the back power plug that we found are not necessary." They plan on sending an improved and simplified conversion to *CQ* shortly.

From over Newtown way, John Stowe, K1UZV/K3TLV tells us he has moved to a new QTH, namely Box 31, Newtown, Connecticut. John would like information on sideband gear and since he is living out of a suitcase, is limited to v.h.f. because of antenna problems.

[*Continued on page 67*]

CQ Century Club Awards

50 Mc

Mrs. R. W. Eggert, WA4BMC
Mary Baucum, K5RWR
Stan Kasper, K2YIB
Kay White, K4TBG
R. F. Ackerman, WA4FIG
Joe Krone, WA2SPL
Joseph A. Stauhs, WA2IUV
Larry F. Kiner, K6VNT
Comanche Noble, WA8BOZ
Lyle V. Lathrop, K1PYX
Don Gillmore, WA2QCQ
Howard E. Perkins, K8EUX
Harry D. Evans, Q1SLL
R. C. Conley, K8KFY
D. L. Heller, K3HNP
Harry Smith, WA2SAZ
John F. Berryman, K4RZK
D. L. Heller, K3HNP (All N. J. stas. '60)

144 Mc

Jack Hellwig, K9ZWU
F. C. H. Smythe, VE3EZC
John F. Rippinger, K9DCZ
Frank D. Evans, VE3BUL
Sune Jansson, SM5DIA
John W. Myrna, WA2QZH
Edward J. Foster, WA2ZOM

YL

LOUISA B. SANDO*, W5RZJ

SPECIAL congratulations to Joyce Polley, KØIKL, for her clean sweep of top awards in YLRL's 23rd Anniversary Party (held Oct. 24-25, Nov. 7-8). Joy not only had the highest score on c.w. (where she has placed either 1st or 2nd since '58), but she also made highest on phone, and with her combined high scores she became the winner of the Corcoran Award. This is the first time that both cups and the Corcoran plaque have gone to the same YL! K5YIB, Barbie, in 2nd place on both c.w. and phone, has been a consistent high scorer in past years. Top scores shaped up this way:

1st c.w.—KØIKL, Joyce Polley	3,607
2nd c.w.—K5YIB, Barbie Houston	3,040
3rd c.w.—K5TXQ, Evalyn Ewing	2,380
1st phone—KØIKL, Joyce Polley	11,200
2nd phone—K5YIB, Barbie Houston	10,733
3rd phone—K5OPT, Ruth Jank	7,975

Corcoran Award

KØIKL, Joyce Polley 14,807

New Zealand WAROC

During the N.Z.A.R.T. Convention in June '61 ZL2JO, Thelma, called a meeting of the YLs attending, who decided to form the New Zealand Women Amateur Radio Operators' Club (see photo). Current officers: Pres., ZL1AXP; V.P., ZL3AO; S/T, ZL2JO. There are over 20 members, most of whom operate on 3.5 as they do not yet have high freq. permits. The club net meets on 3.7 mc at 0700 GMT the second Tues. of each month.

14th YL-OM Contest

The 1963 YL-OM Contest will be held March 2-3, phone, and March 16-17, c.w. See rules in separate box. Note the multiplier has been changed from states to *ARRL Sections*. W9MLE suggests OMs send self-addressed stamped envelopes to all YLs from whom they reque QSL cards.

[*Continued on page 109*]

*4417 Eleventh St., N.W., Albuquerque, N.M.

Rules 14th Annual YL-OM Contest

TIME: (35 hours) Phone—Sat. March 2, 1963—130(EST to Sun. March 3, 1963—2400 EST (1800 GMT Sat to 0500 GMT Mon.)

C.W.—Sat. March 16, 1963—1300 EST to Sun. March 17, 1963—2400 EST (1800 GMT Sat. to 0500 GMT Mon.)

ELIGIBILITY: All licensed OM, YL and XYL operator throughout the world are invited to participate.

OPERATION: All bands may be used. Crossband operation is not permitted.

PROCEDURE: OMs call "CQ YL"—YLs call "CQ OM"

EXCHANGE: QSO number RS or RST report, ARRL Section or country. Entries in log should also show band worked at time of contact, time, date, transmitter and power. (ARRL Section list available for SASE to V.P.)

SCORING: A. Phone and CW contacts will be scored as separate contests. Submit separate logs.

B. One point is earned for each station worked, YL to OM or OM to YL. A station may be contacted no more than once in each contest for credit.

C. Multiply the number of QSOs by the number of different ARRL Sections and countries worked.

D. Contestants running 150 watts input or less at all times may multiply the result of (c) by 1.25 (low-power multiplier).

LOGS: Copies of all phone and C.W. logs, *showing claimed scores* and *signed* by operator must be postmarked not later than March 31, 1963, and received no later than April 15, 1963, or they will be disqualified. Please file separate logs for each section of contest. Send copies of logs to: Blanche Randles K1IZT, 62 Linda Ave., Framingham, Mass.

AWARDS: 1st place phone: YL Cup, OM Cup; 1st place C.W.: YL Cup, OM Cup.

The winner of the phone cup is also eligible for the C.W. cup. Certificates will be awarded to high place C.W. and phone winners in each *District* and country.

No logs will be returned. Be sure it is only a copy of your log sent in for confirmation.

Members of Hoosier Amateur Women's Klub (HAWK) observed the 5th anniversary of the club with a 3-day festival at Plymouth, Ind. Attending the banquet Sept. 29, '61, l. to r., seated: W9RTH (director), K9ILK, K9UXV (treas.), K9FZX (secy), K9SUT (pres.), K9TCM (V.P K9IXD (director), and K9HGY. Standing: K9FNR, K9QJ K5ZBM, K5RWR, K9FIZ, K9FJA, WA5DHC, K9YX K9INM, WA9DPO, K9ZLB (hostess) and W9YWH.

Vol. 5, No. 2—February 1963

VHF AMATEUR

In This Issue

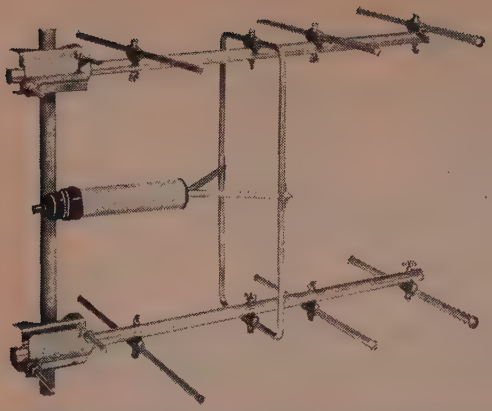
Departments

Cover Story 72
UHF Column 76
DX Report Column.... 77
Lapsus Calami 79
Reader Report 80

Features

The Amazing Skeleton Slot ..... *Bob Brown, K2ZSQ* 70
Twelve Hour VHF Contest 71
Care and Feeding of TV Rotators..... *Michael Karr III, W3JJY* 73
New Linear ..... *Tom Kneitel, WB2AAI* 74
Getting Along with the Indians - II .. *David L. Heller, K3HNP* 75

Address correspondence to: Bob Brown, K2ZSQ, Editor, *The VHF Amateur*, 300 W. 43rd St., New York 36, N. Y.



The Amazing SKELETON SLOT

BOB BROWN, K2ZSQ, EDITOR

WHAT's the story on the slot antenna? Is it really worth the money?" This question somewhat typifies those being bantered about on the air recently as well as at this office. This article won't tell you how to build the antenna, nor do we offer our opinion on one recently purchased. (I don't have one yet.) In recent months, however, it seems that more and more VHF men are gracing the eaves with these antennas, known by some as the nefarious "skeleton." So, being in a position where the above question is constantly ringing in yonder eardrums, we concluded that we'd better come up with an answer quick, else some of our amiable but sometimes unloyal readers give up in disgust and buy Brand X. And, since our VHF SSB man, Bob Heil, K9EID, has been spreading rumors to the effect that he had a slot, we invested a four cent stamp (egads . . . our age is showing) and wrote for his opinion. Suspicions now confirmed, we decided to delve into this amazing antenna to see just what makes it so popular.

Evolution

In keeping with its national tradition of being the first with everything (including controversial VHF antennas), the British have done it again. Yes, the VHF slot antenna is manufactured by the J-Beams Antenna Company of Northampton, England. It also seems that this organization created the frightening term "skeleton," which we are told is that method of feeding the array at infinite impedance, rather than by the normal low impedance way. Hence the term "skeleton (infinite) slot," ad. nausea.

What does the slot antenna actually offer over the conventional VHF long Yagi? Compactness, complete absence of side lobes, sharper beamwidth, modular construction, minimum s.w.r. . . . need we go on?

Stronger Forward Lobe

Once again related to the stacking, we arrive at a stronger forward lobe with the slot antenna. There's a more or less 50% reduction in the amount of beam*width*.[1] So instead of a wide blunt lobe, we get a longer, more directional pattern, greatly increasing our groundwave contact range without swinging a TV-antenna exterminator (67 element monster) on the eaves. DX'ers please note.

Time Payment Plan

The manufacturer informs us that due to the inherent modular construction of this radiator, one can add any number of elements without adversely affecting s.w.r. This also goes for stacking side by side, or one over another. Thus, you can now purchase one of the more basic slot arrays, and, as finances permit you can work up to a larger antenna by simply attaching elements or stacking equipment. As time permits, you make your payments . . . when *you* want.

Broadband Operation

Testing has shown that most of today's Yagi antennas are flexible about 3% of center frequency with a minimum of standing waves on 144 mc.[2] The slot antenna, however, covers as much as 8% without harmful effects. Adding elements or antennas has little or no bad effects on the operation range. This can sure save a lot of final tubes. The distributor guarantees an s.w.r. of less than 1:5 to one across the entire band.

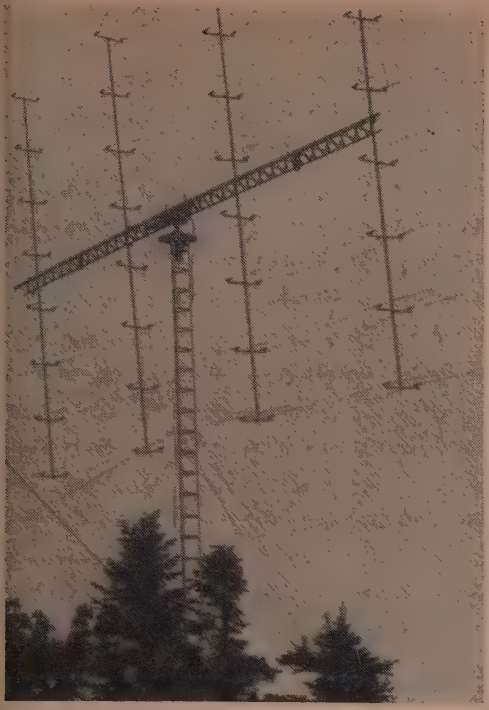
Waterproofing

Waterproof baluns are included with all VHF slot antennas which bring the normally 300 ohm feedpoint impedance down to 52 ohms, greatly aiding the anxious purchaser who wants to get on the air without cutting coax and worrying about s.w.r.

Summing Up

The slot antenna in our opinion seems to offer a great deal to the VHF man, especially the chap interested in extending his normal working radius. It certainly warrants looking into. Bill Roberts, W9HOV, has printed an interesting phamphlet on the subject entitled "The Unique 'Skeleton Slot' Antenna." I highly suggest you get a copy. It's free. Just write Bill at 1209 West 74th Street, Chicago 36, Illinois. Nothing ventured, nothing gained. ■

1, 2Roberts, Wm., "The Unique 'Skeleton Slot' Antenna," Chicago, Ill.



Twelve Hour VHF Contest

Saturday, March 16

Who. All amateurs with VHF equipment worldwide.
What: *The VHF Amateur* 12 Hour Contest.
Where: On any single amateur band, 6 meters on up. This is a "single-band only" contest, so you'll only be competing only with other stations on the same band. No multiple-band entries accepted. If you like, however, you may enter separately in both the 6 and 2 meter division.
When: Contest starts at 9 A.M. local standard time on Saturday, March 16, 1963, and ends at 9 P.M. local standard time that same evening (12 hours). Local standard time is defined as whatever time standard your area might be on, e.g., CST, PST, EST, etc.

Contest Rules

A. *Classifications.*
1. 50 mc only.
2. 144 mc only.
3. 220 mc only.
4. 432 mc only.

B. *Operators.*
1. Any number of operators may work together under one call. Be sure they all sign the log.

C. *Information Exchange.*
1. Your county and state.
2. His signal report at your station.
3. Your contact number to him (numbers starting from 1).
4. Your handle.
5. Typical on-the-air exchange: "Roger OM. You're 59 Union County, New Jersey. You're my number 17. Handle is Bob. Over."

D. *Contact points.*
1. All completed contacts with the required information count one point.
2. Mobile stations may be worked only once during the contest.
3. Aero-mobile and maritime-mobile contacts do not qualify.

E. *Counties.*
1. In the United States only counties will qualify as sections.
2. In other countries the equivalent political sub-divisions will qualify.

F. *Hours Multiplier.*
1. One different contact during each hour of the contest constitutes a "contest hour." Example: 10 hours equal 10 (power multiplier). Simple?
2. These must be NEW contacts—not repeats.

G. *Power Multipliers.*
1. 25 watts input or under (a.m., c.w.), multiplier of 3.
2. 125 watts input or under (a.m., c.w.), multiplier of 2.
3. 1000 watts input or under (a.m., c.w.), multiplier of 1.

NOTE: Power levels should remain constant whenever possible throughout the contest period.

4. S.s.b. or d.s.b. at any power level, multiplier of 3.

H. *Scoring.*
1. Each completed contact counts 1 point.
2. Each county worked scores 1 point (toward county multiplier).
3. Each hour scores 1 point (toward hours multiplier).

4. Your power multiplier, as explained in paragraph G above.
5. Computation: Add up all your contacts, then add up all your counties; count up all the hours and write down your power multiplier. If you're running 20 watts, on the air 10 hours, and work 100 stations in 20 counties, you'll score thusly:
   $3 \times 10 \times 100 \times 20 = 60{,}000$ total score.
   Contacts times counties times hours times power multiplier. Now what could possibly be simpler?

I. *Logs.*

1. Logs should be complete in every detail and should contain your total claimed score. Sheets should include (for a typical contact) your time in, your number, his number, his call letters, his handle, and his signal report (as heard at your end). NOTE: This differs slightly from the verbal on-the-air exchange. Be sure to get all the required information.
2. A cover sheet should accompany all entries including band operated (6 meters, 2 meters, etc.), your name and address, names of other operators, and final claimed score. A letter and photograph would be doubly appreciated.
3. Logs are available free from us. Just send a self-addressed-stamped-envelope for your supply to: *The VHF Amateur*, 300 West 43rd Street, New York 36, New York.
4. FINAL DEADLINE: Monday, April 15, 1963. Tuesday we start compiling results.
5. Send all logs and photographs to:

VHF Contest Committee
The VHF Amateur
300 West 43rd Street
New York 36, New York

New Contest

This twelve hour VHF contest is something new to *The VHF Amateur*, and new to *CQ* for that matter. Inspiration for a short one day contest came from many sources, but basically it was the brainstorm of Bert Simon, W2UUN. Bert, as well as many VHF contesters, would like to see how a short VHF contest would work out; it would certainly not interfere with normal weekend life except on Saturday. *Just imagine: No contest hangover!*

Please note power multipliers. These new figures have been arrived at through much deliberation and study. We feel that using this "one, two, three" system (which could be compared to low, medium, and high power) will be much closer to putting everyone on an equal basis than has ever been done before. We place no accent on the high power boys, nor do we slant the contest toward the Clegg 99'ers. Everyone should have an equal chance to win. *Now let's get in there and pitch!*

Results will be printed in the July edition if logs come in on time. There's a good possibility that they'll even get in the June issue if everything goes according to Hoyle. Since compilation of the results will take place right here at *The VHF Amateur* office, we can guarantee speedy service. Please include a letter with your entry and by all means let's have some photographs! If we have to take the time to write to stations concerned after the logs are in, the results will be that much more delayed. So let's get on the ball!

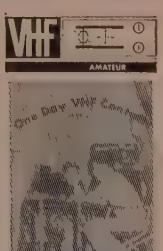
All *VHF Amateur* staffers who want to keep their jobs will be available for points whenever possible (that goes for you too, Dan). Next month's edition will contain more details on that, such as where to look for K2UYH, etc. In any case, listen for K2ZSQ/2 from one of New Jersey's famous mountaintops. (Maybe we'll drag WA2DMQ along just to irritate him). *See you March 16!*

So there you have it, and a month in advance. Drag this magazine along to radio club with you and see if we can't flog the VHF bands with astronomical participation and scores to end all scores. Be looking for you!

Bob Brown, K2ZSQ
Editor, *The VHF Amateur*

■

Cover Story:



Mt. Airy VHF Radio Club

W3CCX

PHOTOGRAPH on our cover page this month shows the 144 mc station of W3CCX, official call of Mt. Airy VHF Radio Club, Inc., during a recent VHF contest. This group, known to many as the "Pack Rats," is one of our nation's biggest and most certainly one of its best.

From left to right in the photo, Frankie Brick, W3SAO, Jim Throop, W2UZN/3; and Warren Parker, W3CKP, all active 6 and 2 meter boys.

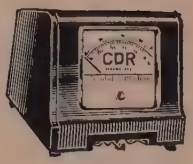
If your club is planning participation in our March contest, we'd like to have similar photographs on hand to show the gang. Make it a point to have the official club cameraman on the spot.

A final reminder about logs: We have printed a generous number of *VHF Amateur* contest log forms expressly for this affair. These are free to any prospective participant.

■

The Care and Feeding of TV Rotators

MICHAEL A. KARR III, W3JJY*
1023 Hoover Avenue
Feasterville, Pennsylvania



Those "under $30" television rotators have all but taken over control of VHF antennas. Here author Karr briefly discusses what to do should something go wrong.

ANTENNA rotators have proved themselves to be an indispensable item for the VHF minded amateur. The rotors used by most 6 and 2 meter operators today were originally designed for TV service, but they have been used most successfully with most VHF antenna arrays.

How They Work

Rotators generally have two separate circuits. One is the motor power circuit which rotates the antenna while the other is the indicator circuit. In some cases the indicator is a voltmeter which measures the voltage across a potentiometer mounted in the rotator itself. Other types simply have a light showing the end of rotation.

The motor usually is a 24 v.a.c. reversible capacitor-run type, and its rotation is limited only by mechanical stops within the housing. Figure 1 shows the most basic type, where the indicator (in this case a light) shows the end of rotation. The power circuit shown here, however, is standard for most commercial rotators. Pressing the directional switch either left or right closes the corresponding contacts, thereby completing the motor circuit so the rotator turns in the proper direction. At the end of rotation, the spring contact in the housing closes, completing the indicator circuit so that the light goes on.

The capacitor in the control box provides phase shifted current for one of the motor coils. The motor direction is reversed through the reversing of the phase relation of the two windings. The transformer steps down the 115 v.a.c. input to approximately 25 volts, providing line isolation and simplifying insulation problems.

Inside the Control Box

Rotators generally are relatively trouble free. Still, problems occasionally arise. The ham who is accustomed to trouble-shooting his rig will find the rotator electrical system quite simple. *Most troubles occur in the control box.* Remember this before you go climbing on the roof. The control box contains the step-down transformer, the capacitor, indicator, and the directional switch. The contact points on the switch should be checked for dirt or corrosion; they may be cleaned with a small fine file. *Caution: Do NOT use emery cloth!*

The motor coils and lead-in cable can be checked for continuity from the control box; a voltmeter will show whether the transformer is in good condition. If the antenna rotates slower than normal, or if there seems to be a "warmup" delay in its turning, the capacitor is most likely at fault. This capacitor is about 75 mfd, an a.c. electrolytic type. A satisfactory replacement is two 150 volt electrolytics back to back (their capacity should be at least 40 mf each). A dual unit is ideal. Cut off the black lead (common ground) and connect the two red leads to the circuit. Good replacements are: Mallory ST75 and the G.E. NPQT-5.1.

Servicing the Rotor

Lubrication of the rotator unit is seldom required, but an annual inspection and application of petroleum jelly (vaseline) or a similar light lubricant to the moving parts will much prolong the life of your rotator. ■

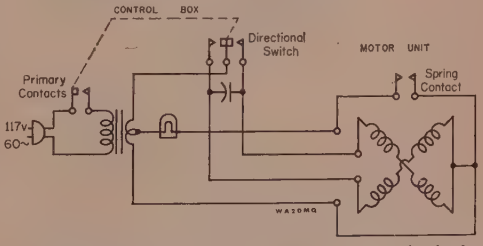


Fig. 1—Basic antenna rotator circuit showing both the control box and rotor. This schematic applies to most TV type rotators but may vary somewhat from one unit to another in the type of indicator employed. Shown here is a light which shows when the end of rotation has been reached.

*Prepared for publication in article form by contributing editor David L. Heller, K3HNP.

New Linear

TOM KNEITEL, WB2AAI, EX-W5KDR
c/o The VHF Amateur
300 West 43rd Street
New York 36, New York

The e.c.i. 6 Meter Linear Amplifier

HERE'S an item which has come upon us from what might be called "left field;" that is, from a company which has its origin in 11 meter gear and has, up until now, devoted its entire production to the 11 meter gang.

The firm, *e.c.i. electronics communications, inc.*, of 325 N. MacQuesten Parkway, Mt. Vernon, New York, has just bestowed upon hamdom their new 6 meter linear amplifier.

Ideal for Transceivers

The unit is extremely well designed (and sharp looking), running 30 watts *output* when driven with as little as one watt. This linear is ideal for transceivers (Clegg 99'ers are ideal).

The linear utilizes a 12AU7 as a d.c. amplifier (for the relay control) and the old dependable 6146 as the final r.f. amplifier. The r.f. is fed through a pi-output network.

Power for amplification is delivered through a bridge-type full wave power supply for stability. The supply uses 12 silicon diodes with one OC2 and two OB2's providing adequate regulation. The bias supply is separate and also fully regulated.

No "Extras" Necessary

A nice feature of this unit is that it requires no external relays or other gagetry. The unit is installed between the TR relay and the antenna. The unit is normally on STANDBY when you are receiving, allowing incoming signals to proceed with caution. After a fashion they jump back on the curb while you transmit. The r.f. feeding into the linear from your own rig kicks the thing on the air. *Everything's automatic!* If you don't feel like taking the band apart with your 30 watts out, you just don't flip the plate switch on the linear. Your low power rig feeds right through without any amplification.

Your controls are GRID DRIVE, FINAL LOADING and PLATE TUNING, and are conveniently located on the front panel along with the PLATE and FILAMENT switches. Also on the panel are the grid and plate meters.

The unit operates from its own self-contained 110 v.a.c. power supply, draining a maximum of 200 watts when transmitting. Pilot lights advise you when the filaments and plates are on. Mobile power supplies are available (as are coils for 10 meter operation).

In addition to all of the above advantages the *e.c.i.* linear runs on everything but gas . . .

This linear will accept just about any kind of signal you care to feed into it: be it a.m., s.s.b., f.m., d.s.b., or c.w.—with actual output (without distortion) running between 30 and 45 watts, depending upon the type of emission used. It will run ninety watts peak envelope power on sidewinding.

Conclusions

We were pleased with the unit, especially in its ease of operation. It was only a matter of about 5 minutes from the packing crate to on-the-airsville with not even so much as a screwdriver, pliers, or an ounce of solder coming into play anywhere along the line. This is truly a lazy man's dream rig.

Of course all this ease of operation does not come gratis and the price tag for the linear runs around $160 (list); however, if you're not in the mood to homebrew a linear and are interested in boosting a peanut-powered 6 meter rig in pronto time, the *e.c.i.* linear may be the answer.

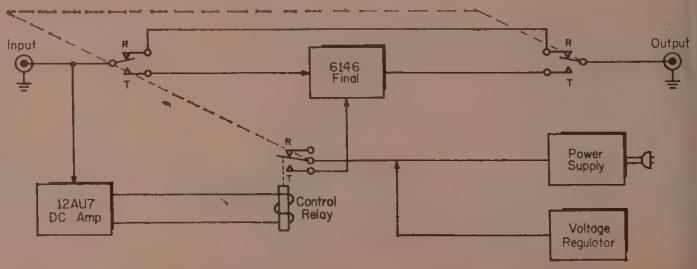


Fig. 1 — Block diagram of the e.c.i. 6 meter linear amplifier, showing how the relays are automatically controlled by the 12AU7 d.c. amplifier. Standard 6146 serves as the 50 mc amplifier.

Second of a Series

Getting Along with the Indians

DAVID L. HELLER, K3HNP
14 Darkleaf Lane
Levittown, Pennsylvania

Last month author Heller discussed TVI committees and the types of neighborhood troubles a new VHF'er might encounter. This month we delve into the cures.

We started this series last month with simple descriptions of how the "indians" react to a nearby amateur, and how to handle them. We also have seen how a TVI committee can be tremendously beneficial in advising amateurs and instructing "indians." Now: The Cleanup of a New Rig . . .

Let us suppose you have a new transmitter for a band you've never worked before, or perhaps you're a new ham. The nice new rig is showing up beautifully on your TV. What now? *This at-home TVI must be cleaned up completely before you do any operating!* I know, it's hard to keep off the air at this stage, but it's necessary. Your sole defense against complaints is that you are clean at home, and this defense is most valuable right at the start. Don't make the mistake of operating only at odd hours in the hopes that all the TV's in the neighborhood are off. Set this precedent and you'll be stuck with it. *Clean up first.*

Overload

Overload is the most common TVI problem. Most TV tuners haven't enough selectivity to reject the amateur signal, especially on six meters. Let's take a typical case of TVI overload: Channel 2 is obliterated, 3 is strongly affected, and 4 and 5 are affected but rather mildly. Overload is almost inevitable on Channel 2, and occasionally will affect all channels, but for frequencies below 54 mc overload effects are always more severe on the lower channels. The cure for overload must be at the receiver, and is a high-pass filter. These filters are covered at length further in this series.

Exciter Radiation

The crosshatching observed on Channel 6 may be some spurious r.f. from the rig. Crosshatching is the sign of r.f. beating against the TV signal. On any channel but 11 its source is probably the exciter stages.

Harmonics

The Channel 11 trouble is the 4th harmonic of 50 mc and can be reduced by careful tuning of the rig, by use of a pi-net final tank, or by a low-pass filter on the antenna line. Harmonic interference with Channel 11 is quite difficult to eliminate in weak-signal fringe areas when high-power 6 meter transmitters are involved.

Filtering The Rig

There are three types of spurious emissions that can give trouble on TV sets: (1) Harmonics of the output frequency (2) Harmonics of oscillator and multiplier frequencies (3) Unrelated parasitic and other spurious frequencies.

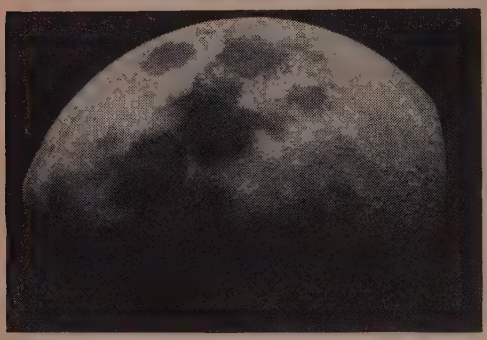
The existence of self-generated parasitics and similar oscillations is indicative of transmitter malfunction, and the cure must be in the circuit itself. Proper neutralization and use of parasitic suppressors are two obvious steps.

Exciter harmonics are contained by proper bypassing and decoupling of any leads that might radiate from the transmitter. High Q tuned circuits throughout the transmitter tend to reduce unwanted harmonics. If the radiation is found to be directly from the transmitter thorough shielding and grounding may be essential; these

Famous Last Words: "Be sure and let me know how that filter works on your TV . . ."

UHF

ALLEN KATZ*, K2UYH



For you fellows who are moon bouncers, W8JIQ sen this picture. His caption reads, "My latest DX." Go to i boys!

WHEN you throw the transmit switch on a new rig, you cannot help but expect the whole band to come back to you. It is quite a disappointment to listen to a next-to-empty band or even have to call the fellow in the next town for a test. Too many amateurs throw the big switch, and never darken the doorway of UHF again. They feel that they have done their part, never realizing that building UHF gear is only an initial step. Next comes the job of keeping your signal on the air, monitoring the band for openings, perfecting your equipment. . . . It may seem paradoxical that on frequencies where technical ability is so essential, that the operator is so important. If you leave the job of keeping the UHF's active to the other fellow, it may never get done.

Activities

Mike, W2GRS reports on 220 mc from Tarrytown, N.Y.:

"My rig is a modified SCR-522 running 20 watts plus to an 832A wired as a push-push doubler on 220.02 mc—it took only 30 minutes. If you think it would help get men up on 220, I'd be happy to write it up." *Sure would, Mike!* "The receiver is a Tecraft converter into a RME-45 and panadaptor. The antenna is a 5 over 5 beam stuck in the south-west direction due to a smashed up rotator.

"All local activity in this area is on the bottom 200 kc. Philadelphia is supposed to be on 221.4 mc, but have never heard them on. Probably it's just a matter of not being around at the right time. Stations active around here are: W2's TQS, NTY, DZA, and K2's DZM, AXQ, DIG, VMD, BMD. Worked down to W2QWC in Passaic, N.J. on November 16; aside from this, activity is pretty poor. Operation here is rather erratic, usually on after 10 pm a couple times a week.

Word of the New Brunswick area APX-6 ne from Bob, K2RGF

"The UHF rig here is still the same APX- and corner reflector (pictured in Dec. UHF COL UMN), although we hope to be on 432 mc soo with a 2C39 tripler. The local gang has gotte together and is holding a net on the low end o the 1296 mc band (about 1225 mc), every Thurs day night at 8:30 PM EST. There are only thre stations presently active on the net: Tom WA2EWG; K2FNM; and myself. Mike K2RMD; Ev, W2SMJ; Tom, WA2VPI; an K2YNT all have converted APX-6's and shoul soon be active. We hope to have ten stations o the net by January, since there are over half dozen unconverted APX-6's still in the area Among other things the net has considered i sponsoring a meeting of all APX-6 operator around the state. During the meeting ideas coul be exchanged, bugs ironed out, and all station could get on the same frequency. We would lik to know how the fellows feel about this idea. *What do you say gang? It would sure be nice t hear some QRM on 1220!*

220 and Up

WØSFP, Andy; KØABK, Bill, and Travi KØHZW, are really having a ball on 220 m running about 110 watts into 5894's. They ar working the 30 miles between each other witho difficulty. Rudy, K9JIJ, is active on 220 mc fro Harwood Heights, Ill., and most likely open fo skeds. Howard, W8JLQ, is set up for 432 m with a real fine station, but is disturbed by a lac of activity in other areas. *Bet the kilowatt powe level will solve his problem!*

73, Allen, K2UY

Contributors Note:

Specially printed UHF Reporting Forms are available in any quantity for contributing to this column. Send a self-addressed stamped-envelope for your supply to Allen Katz, K2UYH, 48 Cumberland Avenue, Verona, New Jersey. Let's hear from you!

*48 Cumberland Avenue, Verona, New Jersey.

DX report

DANIEL L. PARNES*, WA2DMQ ROBERT M. BROWN*, K2ZSQ

WHERE are all those READER REPORTS? What? You didn't think yours would help? You ought to be ashamed. Every letter and reporting form is greatly appreciated and in 95% of the cases it is used right here in this column. We recently consulted our statistical department and came up with some rather remarkable figures. Did you know that to regularly submit a letter and/or READER REPORT to this column that it would only cost you 60¢ per year? I'm sure that you can afford that much to help us present the best DX REPORT column ever. *Let's lay it on the line: We want everyone who is reading this column right now to send in some sort of a note letting us know what you've been doing and what VHF ham radio is like in your area.* Don't rely on the next fellow. Our statistical department tells us that 99-44/100% of the time he's not dependable anyway. Flood us with mail!

We hope that the mail becomes so great that we will have to hire a secretary. Hmmmm . . .

Two Meter Mailbag

Plattsburgh, New York: Bernie Welch, WB2CCO comes through with some 2 meter tidbits . . .

"It was a real pleasure to read *The VHF Amateur* as a part of *CQ!* I sure had been missing a fine magazine!

"Up here in Clinton county (at the top of New York state) we have been having a good show on 2 meters with some of the gang regularly working DX from the 'north country.' Some of the more active stations are WB2CCO, WA2GCH, K2VXR, WA2NVT, WA2HSB, K2IP, WA2THZ, WA2GNZ, W2UXC and K2GJJ. Why don't some of the gang turn their beams up this way more often?" *Okay, boys, you have the word: At exactly 8* PM EST *February 15 all 2 meter men are* ordered *to swing their beams to upstate New York. Standby for contacts galore, Bernie!*

Wilton, Maine: Steve Karkos, K1VUE, writes with long-awaited news on 144 mc in Maine . . .

"I am a college student with an 'economy' two meter station consisting of a BC-625A transmitter, and Eldico MR-2 receiver with a Gem nuvistor preamplifier, and a CushCraft eleven element beam. I am the only active two meter ham here in Franklin County." *Looks like it's all up to you, Steve.*

**The VHF Amateur,* 300 West 43rd St., New York 36, N. Y.

SKED BOX

Policy: Although the Sked Box will appear every month, your listing must be re-submitted to be repeated. No listings are held over. *Deadline for Sked Box listings is the 20th of the month.* All data received after that date will be run the following month. Listings must be submitted on a postcard or the Reader's Reporting Form. Give as complete information as possible. Listings are compiled first by frequency, then by call area. Address all requests to: "Sked Box," *The VHF Amateur,* 300 West 43rd Street, New York 36, New York.

Schedules Wanted—50 Mc

K6UMM scatter. Write: 7452 Lena Park Ave., Canoga Park, Calif.
W7ZQX scatter to Idaho, Mont., N.D., and S.D. Write: 1123 25th Avenue East, Seattle, Wash.
K8REG to Utah, Idaho, and Alaska. Write: 4329 Renwood Drive, Dayton, Ohio.
K9DTB to Nevada. Write: 531 S. Illinois, Villa Park, Illinois.
WA9AHZ to Kalamazoo, Mich., Pa., and Iowa. Write: 9343 S. Hamilton Ave., Chicago 20, Ill.
WØGXJ to Wis., Mo., and Neb. Write: 3534 1st Avenue N.E., Cedar Rapids, Iowa.

Schedules Wanted—144 Mc

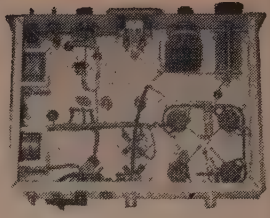
WA2VBX to Rhode Island. Write: Box 85, Rocky Point, New York.
WA2WFB to N.H. and Conn. Write: 115 Hartwich St., Maywood, N.J.
WB2CCO to N.J., Pa., and R.I. Write: 5290-D Missouri Ave., Plattsburgh, N.Y.
K9CGD to South Ill., Wis., Iowa, Ohio, and Mo. Write: 2427 Westover Ave., No. Riverside, Ill.
K9DTB Write: 531 S. Illinois, Villa Park, Ill.
K9RVG to Pa., and West Virginia. Write: 11114 So. Edbrooke Ave., Chicago, Ill.
KØRVA to any direction. Write: 2859 Sidney Street, St. Louis 4, Mo.

"Activity in Maine on two meters has been picking up recently, especially in the second megacycle. Larry, K1SKP, in Billerica, Mass., keeps nightly skeds with K1VTZ, KN1UXA/1, and W1QXR, all in Bangor, Maine, at 1930 and 2130 EST. The distance is about 200 miles. These skeds have been very successful since last July. I also keep random schedules with K1SKP in Billerica at 1920 and 2130 EST whenever I have free time from college work. This distance is about 150 miles. All frequencies involved are near 145 mc." *Good luck with all future endeavors, Steve, and by all means keep us posted.*

[*Continued on page 80*]

YOU CAN'T BEAT THIS KIT FOR VALUE!

P&H
LA-400C
LINEAR AMPLIFIER
800 WATTS PEP
ONLY $179.95*



IT'S EASY TO ASSEMBLE AND WIRE — QUALITY THRU AND THRU

The P&H LA-400-C is not an ordinary kit, because a lot of the assembly has already been done for you. The plate transformer, filter choke, plate tuning capacitor etc. are mounted. Plate coil and band switch are assembled and mounted. Output loading capacitor network is assembled; in fact — about all you have to do is mount small parts, mount sockets and finish the wiring. As for performance — just ask anyone who uses an LA-400-C. Just compare his signal with the so-called "talking kilowatts" — it will be mighty hard to tell 3 DB difference. The difference in cost will pay for a good scope, plus a top notch receiver. One other point — Where else can you get a warranty such as P&H gives you on the LA-400-C ?

ONE YEAR WARRANTY
ON ALL PARTS AND TUBES !

The 80 thru 10 meter band-switching pi network is designed for 800 watts PEP SSB, 400 watts CW, FM or FSK and 230 watts Linear AM (controlled carrier) or 185 watts (constant carrier) with 50-70 ohm output. Popular 100 watt SSB exciters require no swamping or matching networks to drive the low Q untuned input. Grounded grid circuit uses four 1625's or 837's on customers request. Meter reads RF drive, plate current, RF amps output. New modern compact 9" X 15" X 10½" gray cabinet also contains power supply using 816's. TVI suppressed, Parasitic Free.

*Prices effective June 15, 1962
LA-400-C Wired & Tested.....$219.95
Slightly higher West of Rockies.

P&H ELECTRONICS INC
424 Columbia • Lafayette, Ind

For further information, check number 25, on page 110

TVI [*from page 75*]

precautions are highly desirable in any case.

Harmonics of the fundamental output can be reduced by a high *Q* final tank and antenna tuner. Pi-net output tanks are usually more effective in harmonic reduction than link output circuits. However, additional attenuation is often necessary when the harmonics are on TV frequencies—very slight capacitive coupling from the final to the antenna system will permit harmonic radiation sufficient to knock out a weak TV signal even if the attenuation is within otherwise acceptable limits. For these cases a low-pass filter is desirable.

There are several good low-pass filters available. Some are designed for frequencies below 30 mc; these are obviously no good for six. (I've seen them used, though, and they *do* eliminate all interference—*and all signal!*) It's essential that both the frequency, impedance, and power ratings of a filter be compatible with the intended use. Filters designed for six meters have cutoff frequencies close to 54 mc. When operated close to its cutoff frequency any filter is inherently quite sensitive to its input and output terminations. Thus if the line has an appreciable s.w.r. or its impedance differs from that for which the filter was designed, installation of the filter may disrupt the transmitter loading quite severely. This is a good indication of line and antenna mismatch, and does not indicate a defective filter. A good filter, properly terminated, will have no effect on the rest of the system. Filter losses are negligible under proper operating conditions.

Several good tuneable filters are available; the Clegg 372 and Maverick[1] for example. These units will tolerate some mismatching and permit adjustment of the maximum attenuation frequency, possibly at the expense of reduced harmonic attenuation. Suitable fixed-tuned filters include the Drake 100-LP and 1000-LP, identical except for power rating.

My experience shows that the majority of six meter transmitters do not require low pass filters for satisfactory TVI reduction. The filter certainly can have no effect on overload, which is caused by the desired 50 mc radiations, nor can it affect radiations from the transmitter itself. An output filter is not the proper way to care for parasitics that get into the antenna line; the parasitics must be suppressed at their source. The most important case where output filtering is indicated is where problems are caused by harmonics, usually either on the broadcast f.m. band (second harmonic) or on Channel 11 (4th harmonic). A good general rule is to consider a filter the last thing to try. Weekly I hear first-hand of new amateurs on six meters installing a filter on their rig in hopes that their TVI will disappear. Of course it doesn't—seldom does the filter have any affect at all. We've said before, but will repeat: nothing on the rig can take the place of proper antennas and filters on the affected TV sets.

[1]Daskam, S., *VHF Amateur*, June 1961

The TV Set

The TV set must be working properly. If the picture is poor to begin with, the nearby ham certainly won't make it better. Weak or dirty tuners are especially prone to overloading. A major part of clearing of interference complaints is getting the affected receivers working properly in the absence of interfering signals. Owners of decrepit TV sets often expect the amateurs to take this into consideration; this of course is impossible. If the set isn't working properly, receiving clear, snow-free signals, it is unlikely that interference can ever be satisfactorily reduced.

Antennas

The antenna is the most important part of the TV installation, just as it is for the amateur. If it is corroded, bent, broken, mis-aimed, or the transmission line isn't in excellent condition, TVI control efforts elsewhere are futile. A reasonable test of a TV antenna is that if it is over four years old, or is damaged in any way, it must be replaced. The twin-lead similarly must be reasonably new, free of breaks, cracks or splices. Antenna switches, especially the open knife switches frequently used, are TVI generators. Multi-set couplers usually give trouble. Off-breed filters installed along the transmission line, or even Drake filters improperly installed occasionally accentuate the trouble.

Occasionally clear-vinyl twinlead is found on a complainer's installation. This cable is not suitable for outdoor use.

Indoor Antennas

Indoor antennas are not considered sufficient for any TV installation. This applies especially to rabbit ears and the many well-advertised variations thereof, but an attic antenna installation is also inferior. Nearby wiring and pipes produce reflections, and a normal roof will definitely attenuate TV frequencies. The need of good rooftop installations is even more pronounced for UHF TV, for in the 900 mc region any obstruction will provide serious attenuation.

The Amateur's TV

I'm often asked what the amateur is permitted to do to his own TV to make it clean for inspection. Is he allowed two filters? Is he allowed to shield his own set? The answer is that the amateur may do anything he pleases with his own set so long as he can demonstrate interference-free reception on the local channels. The inspection is not a test of the TV set. It is a test of the transmitter. ■

Next Month: Filters

In our March edition K3HNP covers the various types of high-pass filters, pointing out which are best on the VHF bands.

GIVEAWAY!

UHF Reporting Forms, expressly for our UHF Column. Write: K2UYH, 48 Cumberland Avenue, Verona, New Jersey, S.a.s.e. please.

Free two year subscriptions! If your article is published in *The VHF Amateur*, you'll receive a check plus a two year sub (or extension). Let's hear from you.

Free dollar bills! If the photograph you submit is published in *The VHF Amateur*, you'll get a free photo of General Washington on nice crinkly green paper.

Free DX Reporting Forms! For your supply, write today to: *The VHF Amateur*, 300 W. 43rd St., New York 36, New York, S.a.s.e. please.

Read *The VHF Amateur*—published exclusively for the v.h.f. enthusiast.

Work Sporadic-E Skip?

Write today for your copy of "The Sunspot Story, Cycle 19, The Declining Years," by CQ's own W3ASK and Stanley Leinwoll. Send $1.00 to Hal Weisner, WA2OBR, c/o The VHF Amateur, *300 W. 43rd Street, New York 36, N. Y.*

Lapsus Calami

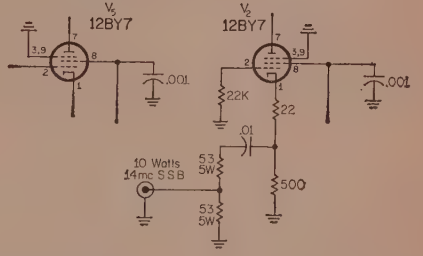


Fig. 1—Correction for the "SB-62", page 93, November 1962 edition. Please correct your diagram as shown.

WANT MORE VALUE FOR YOUR DOLLAR?

LO NOISE—2.5DB
HI OVERLOAD QUALITY PERFORMANCE

Model C61—6 Meter Converter $28.50
Model PS4—Matching Power Supply 9.75
Model P62—6 Meter Preamp .. 9.75
Model C23—2 Meter Converter 34.25
Model P25—2 Meter Preamp .. 9.75

6 METER NUVISTOR CONVERTER
$28.50

AMPLIDYNE LABS
KINGS PARK LI NY
P.O. Box 673

DX Report [*from page 77*]

San Diego, California: K6QWZ writes from the sunny state . . .

"Worked W7LEE at 2210 PST, November 10, in Parker, Arizona, for a 200 miler. Two days later (Nov. 12) we snagged W6FZA, of Porterville, Calif., for a 250 mile path. Signals ranged between S3-4. W6RUE (200 miles) was worked on Nov. 22nd.

"Present skeds are maintained with W6FZA at 2100 PST daily on 144.015 mc. Recently heard W6GDO near Sacramento for a 450 mile path!" *I guess that cross yagi system of yours is really doing the trick! Be sure and let us know if you snag W6GDO!*

50 mc Activities

W1: K1OAV from Danbury, Conn. wrote to us and pointed out a possible error regarding the WAB (Worked All Brothers) award. The correct title for this certificate is WAM (Worked All Monks). It is given by the four hams *(VHF, natch)* at Graymoor, Garrison, N. Y. At this writing we are waiting for a reply from WA2-RRK at Graymoor for qualifications. Jerry, K1OAV, works Bro. Lawrence every week, and caught WA2UMG while all four were going mobile to the Mobileer Hamfest in Bethlehem last July 4th. "WA2PCM", says Jerry, "is the only one who rotates his beam towards Danbury." The others favor the N.Y.–N.J. area.

W3: K3MZO writes, "In the balmy spell of weather that terminated November and continued to the 3rd of December, groundwave was at a high. Although getting very little during weekdays, I put the whole day of Sunday, December 2nd to the six meter band.

W4: From the land of sunshine, K4YHG, Tampa, Fla., on Oct. 4, worked W5BGA in Houston, Texas. K4YHG approximates the distance to be an 1100 mile path.

W7: Scatter schedules have been maintained between W7ZQX, Seattle, Wash. and W6NLZ every weekend. W7ZQX is running the full limit on c.w., which makes copy on the other end a little bit easier.

W8: Groundwave during late November for K8WXW has given him contacts in Ohio and Ind. Bob, using low power (about 5 watts) nevertheless got out about 100+ miles from Blissfield, Mich.

W9: WA9AHZ reports that he has been inactive, but will be on the air again soon if not already at this writing, with 2000 watts p.e.p. on 6 meter s.s.b. For those looking for a Chicago QSO should certainly listen for him.

WØ: And to wind up 6 meter activity for this month is WØGXJ from Cedar Rapids, Iowa. Bob did FB during late Oct. by getting into these states: Mass., N.H., Fla., and Ill. on excellent conditions on the 26th and 28th.

Get With It!

Let's see those REPORTS! We have free "long forms". Just drop a line. See you next month.

73,

Bob, K2ZSQ
Dan, WA2DMQ

Reader Reporting Form

Fill Out Now! **Month of January, 1963**

This form serves as the basis for our DX REPORT column in *The VHF Amateur*. Your participation in this program is of utmost importance, for without news-activities reports from you, we cannot provide a truly comprehensive column. *Deadline:* February 20, 1963. Return this form to: DX REPORT, *The VHF Amateur*, 300 West 43rd Street, New York 36, N.Y.

Your name ..... Call .....

Address ..... City ..... State .....

This report covers my 6 2 220 432 (circle one) activities for the period. Enter only one band's activities on this form. Extra forms free upon request. (S.A.S.E. please.)

Antenna (number of elements and type) .....

Best DX During January

Date	Time	Call	Location	Sig. Rpt.

Sked Box Listing: Do you desire schedules to a particular area? (Give state.) .....

.....

Do you presently hold skeds? (List calls, times, days and frequencies) .....

.....

Approximate distance of longest contact made this month (give details: call, number of miles, day, *etc.*) .....

DX [*from page 50*]

as yet. Rudy will not have cards printed until he receives logs and QTH proof from 4W1AA. *(Tnx W3CXX es WGDXC).*

4X9 Israel: 4X9HQ who caused quite a stir recently is headquarter station of the Israeli Radio Club.

5N2 Nigeria: W9FVK tells us that he is *not* QSL Manager for 5N2JKO. Cards should go to W4MGM.

Here And There

With current DX attention being centered on Gough Island, it might be of interest to look at the Island a little more closely.

Gough Island, sometime referred to as Diego Alvarez Island, lies roughly 250 miles SSE of Tristan da Cunha at about 40° South Latitude and 10° West Longitude. The island is volcanic in origin and is quite rugged and mountainous with the highest peak being recorded at 2986 feet. The Island is eight miles long and four miles wide. The coastline generally consists of precipitous cliffs which rise 200 to 1000 feet above the sea. It is the breeding place for the Giant Wandering Albatross and is home for numerous seals, penguins and cray fish. The guano deposits are described as being "rich." The Island was originally called Diego Alvarez Island but is now generally referred to as Gough Island, named after Captain Gough who visited the Island in 1731. It was claimed by the British in 1816 and on 12 January 1938 was made a dependency of the British Colony Saint Helena, a status it shares with Ascension, Tristan da Cunha, Nightindale and Inaccessible Islands. The Island has no permanent population. On a few occasions it has harbored the crew of shipwrecked vessels but more often has been visited in connection with scientific expeditions. Aside from the life sciences, Gough is of interest because it represents one of the few outcroppings of the Mid-Atlantic Ridge. This giant, and for the most part submerged mountain range snakes down the very center of the Atlantic for about 10,000 miles. Some of its outcroppings provide us with our choicest DX, e.g., Ascension, St. Peter and St. Paul Rocks, Tristan da Cunha, Bouvet, *etc. (Tnx WGDXC).*

Certificates

KING, Keihanshin Information Net Group, will award an attractive certificate attesting honorary membership. Applicants for this certificate should submit five (5) member QSLs and ten (10) IRC to Award Manager, JA3CUK (Kenichiro Fujiyama) 21-2 Kikawahigashino-cho Higashiyodogawa-ku, Osaka, Japan.

Some KING members are JA3AA, AHG, AQ. ARX, ASF, BEA, BEK, BP, BQH, BQX, BXC. CAF, CHO, CUK, DDG, IL, KM, TC, UI. *(Tnx JA3CUK).*

QTH's

DU1GF	via W6ZJY.
DU1VQ	via W6ZJY.
ET3JK	via LWFBS, P. O. Box 654, Addis
ET3FW	Ababa, Ethiopia.
ET3LM	now W7KMF.
FO8AA	Club Oceanien de Radio, Box 374, Papeete, Tahiti.
HC1DC	Donald McClennon, Tamayo 1571, Box 289, Quito, Ecuador.
HKØZU	via W4BJ, Ray Farwell, 370 NE 147 Terrace, N. Miami 61, Fla.
HS1C	now W4RIM, Maj. Hal S. Christensen, 56 Third Inf. Road, Fort Leavenworth, Kansas.
KC6BD	Jack Wheeler, U. S. Weather Bureau, Truk, E. Caroline Islands, Pacific Trust Territory.
LA9RG/P	via LA5AD.
PJ5MC	(between Oct. 26 and Nov. 2) via W3ZQ.
PK1AP	via K9SAD.
VK9MB	Father Ben Madden, S.J., Capuchin Mission, Mendy SHD, Papua.
VP1MM	Box 411, Belize, British Honduras.
VP2LA	(s.s.b. only) via K8ONV.
VP2ML	via K8ONV.
VP3RS	Bill H. Blaycock, 1383 Canfield, Memphis, Tenn.
VP5DB	via WA2IFY, Navy 104, FPO, N. Y., N. Y.
VP5XG	(ex-VU2XG, 4S7XG) A. P. W. Windle, POB 628, Kingston, Jamaica.
VP8HD	via G3PEK, 48 Moorland Road, Woodsmoor, Stockport, Cheshire, England.
ZD1A	via VE7ZM.
ZS2GF	via W1BPM.
ZS3LW	via W1BPM.
ZS6BBB/ZS9	Box 9321, Johannesburg, S. Africa.
ZS6PC/ZS9	Box 9321, Johannesburg, S. Africa.
ZS7M	via W2CTN.
4X4DH	via W5VSQ.
9L1RO	Ron Oxley, Pepal, Freetown, Sierra Leone.

Field Strength Meter [*from page 44*]

to 30% in the 10 meter band.

This means that not only must you voltage-calibrate your f. s. meter, as advised, but you must also make a separate calibration at each frequency at which you intend to use the instrument. That is, if you want the instrument to tell the truth.

Effect of Meter Resistance

Rectification efficiency varies also with load resistance; i. e., the higher the resistance, the higher the d.c. output voltage of the diode. In a field strength meter, the load resistor is the meter. Depending upon manufacturer and type number a current meter of given range may have a different internal resistance than that used by the designer of the f. s. meter you have copied. Thus, a 0-1 d.c. milliammeter may have an internal resistance of 50, 100, or 1000 ohms, depending upon type number and who made it. Therefore, it is important that you use the exact model specified by the designer.

Effect of Tuning

The *LC* ratio of the resonant circuit (L_2C_1 in fig. 1) varies as the circuit is tuned, and this is why r.f. voltage E is higher at the high frequency end of the tuning range (where C_1 is low) than at the low frequency end (where C_1 is high). The resonant tank voltage may differ by a factor

[*Continued on page 86*]

Transfilters—"Where can I obtain information on solid state ceramic filters used in place of i.f. transformers in transistorized receivers, and where can I buy the units?"

For tech info on the units see *Radio-Electronics*, Oct. 1962, pages 41, 42 and 43. Units can be obtained from the Ace Radio Control Inc., 203 West 19th St., Higginsville, Mo. The units are very inexpensive and range in price from $1.15 to $1.25 each.

By the way, these units are made by the Electronics Components Division of Clevite Corp. and when used, these Transfilters (as they are called) have other uses besides being utilized to replace i.f. transformers.

DX-60 Hints (40 Meters)—It has been reported that merely removing the oscillator tube shield in the DX-60 will often permit straight-thru operation without trouble. Another hint received, suggests removing about 23 turns from the oscillator coil and retuning the stage. I am inclined to go along with this last hint.

Viking Ranger Standby Noise—"I purchased a second hand Viking Ranger along with a TR switch. The set works fine except that in standby position I get receiver noise. I know that a long time ago I read an item on this somewhere. Can you help?"

The item you refer to has appeared in *CQ*, *QST* and other mags. Merely connect a 47K 1 watt resistor from pin 7 of the 6AQ5 clamp tube in series with a diode (any type with a good front to back ratio will do). The anode end of the diode should go to the −28 volts (modulator bias) connection. This will stop the noise. Make sure your Ranger uses bias rectifiers and that you disconnect the "gimmick" for c.w. operation.

Power Inverter (12 v.d.c. to 110 v.a.c.)—"I need a 200 watt, 110 v.a.c. 60 cycles conversion unit which operates off a 12 volt battery. The battery is installed in my boat. What do you suggest?"

I suggest a Terado power inverter. Write Terado Corp. 1055 Raymond Ave., St. Paul 6, Minn. They have units from 15 to 300 watts, 6 to 12 volts d.c. input and the prices start at $12.95 list.

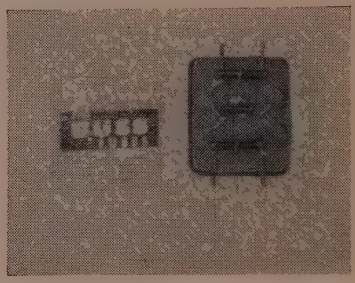
Big Screen Oscilloscope from TV—"I have an old 12" TV set still in fine operating condition. What I would like to do is to get detailed plans to make a big scope out of it for classroom use. Any info on this please?"

Yes, write Kelco, Box 10563, Houston, 18 Texas. They will send you plans for $2.00.

Incidentally, there are a number of ways to make a scope out of an old TV set. The method I have used with success is to remove all r.f., i.f. and audio circuitry. Modify the vertical and horizontal oscillators for low and high frequency operation, and add a simple vertical and horizontal and amplifier circuit. Few extra parts are needed.

The 2DS4 Nuvistor Tube—"I note that the new RCA 2DS4 Nuvistor tube has a 2.1 volt heater. This seems to be very odd because I do not know of a 2.1 volt transformer secondary. How about using 2.5 volts on it?"

You can use 2.5 volts on it but I do not recommend it because you are likely to run into shot noise you do not want in u.h.f. circuitry. Running the tube at 2 volts would be better. You can reduce the 2.5 volts to 2.1 volts merely by using a series resistor.



A neat way of building and shielding small high-pass filters. The components are soldered "in mid-air" and may be encapsulated in epoxy resin or other potting compound. Even better shielding can be obtained by soldering the Buss fuse box closed.

High Pass Filter Mounting Hint—W3ZNL sends in an idea of mounting a high pass filter. The components used for constructing a TV filter are very small and can be fitted into a Buss metal fuse container. Potting compound may be used after all parts are mounted. Thanks Bob.

Helping Others—Evidently there are many hams with kind hearts who read this column—for according to the Secretary of the Plainfield High School Radio Club for whom we printed a request for equipment assistance sometime ago, the response was *terrific*. One ham, (W2RWQ) even donated a 500 watt linear to the club—"75" to him.

Thanks fellows for helping out the younger set. If we would *all* do this, ham radio would be better than ever.

Thirty

HAM CLINIC covers the "ham front." We range from gripes to swipes and we *try* to help everyone seeking technical information. However, we do want to let you know because of the slow mail delivery to our present overseas address, that you must wait at least a month for a reply, when you send your query via *CQ* Headquarters. The average letter from Switzerland to the United States costs about 25¢. If you need quick help, address your letter to me at 37 Halden Str., T.M.C. Systems Ag., Luzern, Switzerland. Please enclose the necessary International reply coupons. Mail to and from *CQ* is sent in batches and remailed in New York with U. S. postage. . . . so again, if you're not in a hurry, be sure to include the necessary self-addressed stamped envelope.

For this month then, all the best to our good readers everywhere . . . let us hear from you.

72, 73 and 75. Chuck, W4VZO/HB9

eemed very sorry that this was to be our last neeting and expressed the desire to have us sit them again in the near future.

One will never meet a finer gentleman than Gus Roblot and he is a credit to amateur radio. We were indeed very fortunate to have a man f his calibre available to help us out while n the island. In fact, all of the people were ery friendly and extremely cooperative. We ish to thank Gus and all of the people menoned in this article who contributed to the ıccess of this DXpedition.

In summarizing the results of our eight days f operation, a total of 1779 stations in 51 ountries and 42 states were worked. Of the wards we hoped to obtain we only succeeded ı getting WAC.

At 9:30 AM on August 11th we took the lane back to Sydney, picked up our car and tarted on the long journey home. We arrived ome on August 13th in a very tired condition. Ve were very happy that we had been fortunate nough to operate on St. Pierre and hope that ıe opportunity will come again.

Recommendations

To all who contemplate a DXpedition to t. Pierre, or any other place, we would like o offer some suggestions. We were well quipped for any emergency but it developed ıat we did not even blow a fuse. The most nportant consideration is weight and in the ase of a receiver there can be no doubt that ıe best receiver possible is the answer regardess of weight. In the case of the transmitter ne has quite a choice. A Viking 2 gets heavier he further one travels. If you operate only c.w. would be very wise to build a small rig in dvance of your trip, and use a 6146 final vhich would fit nicely into the power limits ermitted. If you intend operating only c.w., ou could beg, borrow or steal a few choice rystals that would permit harmonic operation n all bands. It was found that a few crystals ould have sufficed as most of our work was n c.w. Of course, if you are going to operate rictly phone it would be nice to have a v.f.o. vailable as the needed operating frequencies e not so easily obtained due to harmonic lationship.

Regarding antennas, permit me to suggest at you figure on using 75 feet of coax cable r each antenna that you intend to put up. ıe length will depend on the orientation of e antenna in the hotel yard. Use the smaller G-58 type cable to save weight as the large ble that we took occupied a surprising amount space and contributed greatly to the total ight of the equipment. Since there are no /I problems on St. Pierre it would appear at a simple effective antenna would be rallel-dipoles cut for the intended operating quencies, and fed with a single 100 foot length of RG-59/U cable. It is intended to use this type of antenna on our next trip to St. Pierre. Be sure to bring along all necessary spare parts as there is very little hope of getting parts on the island and it would not be wise to think of obtaining spare parts from Gus who, incidentally, has the same problem.

Travel Methods

Regarding the trip to St. Pierre I would like to point out that it is the closest place to go to and still be assigned a rare call. It is also one of the most difficult places to get to unless you intend on taking a plane from Sydney. It is quite true that many amateurs have left for FP8 land and few have actually arrived. If definite boat schedules could be made, there would be more DX-peditions going to the island. When one misses the boat it is mighty discouraging. It is for that reason, I offer further information on all alternate ways of getting to FP8! land in the event that you do not plan on plane travel. It is well to point out that you must have the time available in order to compensate for the time saved by plane travel. All routes are based on leaving North Sydney and travelling either all or part of the way by boat, train, cab or your own car. Next to plane travel the next best bet is via the S.S. *Langlade* or *Miquellon* if you are fortunate enough to be able to catch the boat before it sails. The latter two routes are very time consuming and are fine for enjoying scenic beauty if you have more than a two week vacation period available.

ROUTE 1—Leave your car in North Sydney. Then take the S.S. *Langlade*, a converted mine sweeper accommodating 10 passengers or the S.S. *Miquellon*, a converted coast guard cutter accommodating 20 passengers to St. Pierre. There are no definite sailing schedules and reservations cannot be made. The agent for the steamship company in North Sydney is Mr. E. B. Jackson of Joseph Salters and Sons. The fare is $20 each way and the 160 mile trip requires 17 hours.

ROUTE 2—If you desire to travel via Newfoundland by car you take the car ferry in North Sydney to Port-au-Basques, Newfoundland. This trip is made by the S.S. *Cabot Strait*, holding 142 passengers and the S.S. *Basques* accommodating 117 passengers. It is a ten hour overnight trip and the fare is $19 a round trip. Cars are accommodated aboard. Then you have to motor 700 miles thru Newfoundland to Fortune. Park your car and take the M.V. *Spencer II* to St. Pierre. The fare is $15 round trip. The *Spencer* leaves Fortune for St. Pierre on Tuesdays, Thursdays and Saturdays at 1 P.M. and the return trip is made on Wednesday, Friday and Monday at 10 A.M. The *Spencer* sails from May 23 to October 1st, and the agent is C. B. Spencer Sons in Fortune, Nfld. Reservations must be made in advance of arrival. As to the condition of the roads in

[*Continued on page 109*]

Prop [*from page 53*]

South Africa	08-11 (1)* 06-10 (1) 10-12 (2) 12-14 (1)	05-07 (1) 11-13 (1) 13-16 (2) 16-18 (1) 21-23 (1)	19-22 (1)	20-21 (1)
Eastern Mediterranean	08-11 (1)	07-12 (1) 19-21 (1)	18-21 (1)	*NIL*
Central Asia	07-09 (1) 17-19 (1)	07-09 (1) 16-18 (1) 18-20 (2) 20-21 (1)	05-08 (1)	*NIL*
Southeast Asia	16-18 (1)* 08-09 (1) 09-11 (2) 11-15 (1) 15-17 (2) 17-20 (1)	07-09 (1) 09-11 (2) 11-13 (1) 19-23 (1)	03-05 (1) 05-07 (2) 07-09 (1)	05-07 (1) 04-06 (1)†
Far East	15-18 (1)* 13-14 (1) 14-16 (2) 16-17 (3) 17-19 (2) 19-20 (1)	07-12 (1) 12-14 (2) 14-17 (1) 17-19 (2) 19-21 (3) 21-22 (2) 22-23 (1)	00-02 (1) 02-06 (3) 06-08 (2) 08-09 (1)	02-03 (1) 03-05 (2) 05-07 (1) 03-06 (1)†
Pacific Islands & New Zealand	10-12 (1)* 12-16 (2)* 16-20 (1)* 09-10 (1) 10-12 (3) 12-16 (2) 16-19 (3) 19-20 (2) 20-22 (1)	07-08 (1) 08-10 (2) 10-17 (1) 17-19 (2) 19-22 (4) 22-00 (3) 00-02 (2) 02-04 (1)	21-22 (1) 22-05 (3) 05-07 (2) 07-09 (1)	22-00 (1) 00-05 (2) 05-07 (1) 02-06 (1)†
Australia	14-18 (1)* 07-08 (1) 08-12 (2) 12-17 (1) 17-20 (2) 20-22 (1)	07-08 (1) 08-10 (2) 10-20 (1) 20-23 (2) 23-03 (1)	01-03 (1) 03-05 (3) 05-07 (2) 07-08 (1)	02-03 (1) 03-05 (2) 05-07 (1) 04-06 (1)†
North & Central South America	07-12 (1)* 06-08 (1) 08-10 (2) 10-12 (1) 12-14 (3) 14-15 (2) 15-17 (1)	06-07 (1) 07-09 (2) 09-15 (1) 15-17 (2) 17-19 (4) 19-20 (3) 20-22 (2) 22-03 (1)	18-20 (1) 20-00 (3) 00-03 (2) 03-05 (1)	19-20 (1) 20-00 (2) 00-04 (1) 20-03 (1)
Argentina, Chile & Uruguay	08-12 (1)* 12-14 (2)* 14-16 (1)* 06-07 (1) 07-09 (2) 09-11 (1) 11-14 (2) 14-16 (3) 16-18 (2) 18-19 (1)	13-15 (1) 15-18 (2) 18-20 (3) 20-22 (2) 22-03 (1) 06-09 (1)	18-20 (1) 20-02 (2) 02-03 (1)	19-20 (1) 20-01 (2) 01-03 (1) 20-01 (1)
McMurdo Sound, Antarctica	12-15 (1) 15-18 (2) 18-20 (1)	09-11 (1) 16-19 (1) 19-22 (2) 22-02 (1)	00-06 (1)	*NIL*

Explanation Of Forecast Ratings

The numerical rating appearing in parenthesis follow ing each predicted time of band opening indicates th *total* number of days during each month of the foreca period that the opening is expected to occur, as follow

(1) Less than 7 days
(2) Between 8 and 13 days
(3) Between 14 and 22 days
(4) More than 22 days

For the *specific* days of each month on which a pa ticular opening is most likely to occur, as well as day-to-day forecast of reception conditions (signal qua ity, noise and fading levels), see the "Last Minu Forecast" which appears at the beginning of this colum

The *CQ* DX Propagation Charts are based upon double-sideband AM effective radiated power of 6 watts, a single-sideband ERP of 300 watts, and a C ERP of 150 watts, at antenna radiation angles less tha thirty degrees. The Eastern USA Chart can be used the 1, 2, 3, 4 and 8 amateur call areas; the Central US Chart in the 5, 9 and Ø areas, and the Western US Chart in the 6 and 7 areas. The Charts are valid throu March 31, 1963. Propagation information contained these Charts is derived from Basic ionospheric data pu lished by the Central Radio Propagation Laboratory the National Bureau of Standards, Boulder, Colorad

Space [*from page 54*]

command signals from the ground. The entire communication equipment aboard the spacecraft weighs 13 pounds and fits into a space measuring $6 \times 6 \times 12$ cubic inches. The wallop it packs, however, can be heard for more than 37 million miles.

Power for MARINER II is supplied by two fins which contain a total of 9800 solar cells. The cells collect energy from the sun and conve it into approximately 200 watts of electric power. A silver-zinc rechargeable battery with capacity of 1000 watt hours is also carried aboa the spacecraft.

One of a series of two special stamps issued recently by France to honor space communications. The above stamp shows the TELSTAR communication satellite, and commemorates the first trans-Atlantic TV broadcasts transmitted from the French ground terminal station at Pleumeur-Bodou to a similar station at Andover, Maine, via TELSTAR on July 11-12, 1962.

The signals which command MARINER II a transmitted from the Deep Space Instrument tion Facility network of NASA. The netwo presently consists of stations located at Gol stone, California, Woomera, Australia and J hannesburg, South Africa. The Goldstone a Johannesburg stations are almost identical, wi each using an 85-foot diameter dish antenna f receiving and transmitting, 10 kw transmitters 890 megacycles, and receivers with both Mase and parametric amplifiers. The Woomera statio is also similar in design, but its power is on 50 watts at the present time. All three statio were used to command MARINER II at "nea in" ranges, while Goldstone and Johannesbu maintained contact as the spacecraft passed V nus and penetrated further into space.

From the information transmitted to earth MARINER II, scientists hope to unravel t mystery of the atmosphere surrounding Venu and to determine if life like that on earth cou survive on the planet. Future MARINER spac crafts are planned for investigation of Mars a

[*Continued on page 86*]

GOTHAM VERTICALS DELIVER THE CONTACTS

THE ULTIMATE PROOF OF THE FINE PERFORMANCE OF THE GOTHAM VERTICAL ANTENNAS IS IN THE ACTUAL FIELD RESULTS, BY HAMS ALL OVER THE WORLD.

PROVEN! PROVEN! BY THESE EXCERPTS FROM UNSOLICITED TESTIMONIALS:

CASE HISTORY #71
"I am very delighted with the first V80 and want another for a different location." A. C., California.

CASE HISTORY #159
"I ordered a Gotham V40 Vertical Antenna and found it so successful that several others are wanting them too. Will you please send me four more." W. A., Alaska.

CASE HISTORY #248
"I just wanted to let you know how pleased I am with my Gotham V80 antenna. I have worked a W.A.S. of 46/43, a WAC of 3/3, and DXCC of 14/12 in about 12 months." G. W., Maryland.

CASE HISTORY #111
"The V160 did a beautiful job on a VE1 for me. Also, I forgot to take it down during the hurricane of last week. It is just as straight as it was when I bought it." D. S., New Jersey.

CASE HISTORY #250
"I have one of your vertical antennas and have been having fine results on 10, 15, and 20 meters." N. S. P., Missouri.

CASE HISTORY #613
"I have never been happier with any antenna than I have been with the V80. I have worked all bands with it and have had tremendous success—i.e., DL4s, ZS3, etc., all solid copy." R. D. S., Penna.

CASE HISTORY #483
"My V80 is working wonders. I am able to maintain a 1:1 SWR all across the 40 meter band. After many years on 10, 15, and 20, the XYL and I are getting great kicks out of some oft he lower bands." J. A., New Mexico.

CASE HISTORY #123
"I am full of praise for your vertical. In the recent field day, we went up to the mountains near here and QSO'd a KA2, KZ5, and an XE at 2100 PDST on 15 meters. We got a 59 plus from the KA and KZ and 58 from the XE." D. P., Nevada.

CASE HISTORY #398
"Some months ago I purchased one of your V80 vertical antennas. I have had wonderful results with this antenna, and I think it was of far greater value than the small amount I paid for it." R. C., Utah.

CASE HISTORY #766
"The Gotham vertical takes almost no room. I don't see how I could have used any other type very well. Sure do appreciate the fine record this antenna has made so far." H. C., Haiti.

DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA IN JUST A FEW MOMENTS, REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.
2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

FILL IN AND SEND TODAY!

Airmail Order Today—We Ship Tomorrow

GOTHAM Dept. CQ
1805-A PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE HAM WHO OPERATES 40 AND 15 ..... $14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name_____

Address_____

City_____ Zone____ State_____

For further information, check number 11, on page 110

Space [*from page 84*]

the interplanetary space between the planets and the earth, as man takes giant steps forward in unlocking the secrets of the Universe.

While it was not technically possible for radio amateurs to receive MARINER's signal from deep space, the circuitry developed to accomplish the record-breaking DX transmissions will eventually find their way into the design of amateur equipment. The equipment design which made it possible to hear the MARINER II spacecraft from 37 million miles in space may someday make it possible for radio amateurs to establish new v.h.f. and u.h.f. DX records on the surface of the earth, and in space by means of moonbounce and communication satellites.

73, George, W3ASK

Field Strength Meter [*from page 81*]

of 10 at opposite ends of a frequency band.

This points up again that response of the simple f. s. meter is not the same at all frequencies within the operating range. But this vagary is automatically corrected if a separate calibration is made at each operating frequency, as previously advised.

Summary

So much, then, for the reasons why the simple field strength meter often shows such aggravating eccentricities. What corrective measures can be taken? Here they are:

1. Use the exact components specified by the designer.

2. Calibrate the f. s. meter at as many points on the microammeter scale as possible, using an r.f. signal generator having direct-reading microvolts output. Make this basic calibration at the lowest frequency to which the f. s. meter may be tuned. On the basis of this calibration, preferably draw a special volts scale for the meter; or if this cannot be done, prepare a calibration curve or chart.

3. Repeat the calibration procedure at each frequency at which the f. s. meter is to be used. And on the basis of these calibrations, either (a) prepare a separate calibration curve or chart for each frequency or (b) work out correction factors for the various frequencies (for example, your correction figure might show that you must multiply the basic calibration by 0.5 at 50 mc, 0.2 at 100 mc, etc.).

Carefully attend to these matters and you will have a useful, dependable instrument instead of a toy.

Finally, something should be said about maximum sensitivity of the instrument. The very best diode-type f. s. meter will not respond to signals weaker than about ½ millivolt r.m.s. The germanium diode just does not rectify at lower a.c. voltages; this, unfortunately, is the nature of the beast, and little is to be gained by inserting a tremendous d.c. amplifier between the diode and microammeter. ■

ZL Special [*from page 76*]

Since C equals 104.6" and E equals 11", D equals the difference, 93.6".

In this way a perfectly normal aluminum tube structure can be built, like any other beam, with the delay line stretched from one element to the other, and yet the two elements are fed with the correct phase relationship.

Figure 1 gives the dimensions and the spacing of the elements for various frequencies in the 15 and 20 meter band. The length of time that I have been using this beam will be obvious from the fact that I have made the calculations to include 14.4 mc, clearly indicating that I constructed this beam before we lost the top 50 kc of the 20 meter band.

Impedance Matching

Lastly there is the question of impedance matching. In most descriptions which I have seen the delay line is made of 300 ohm cable. I do not think this is necessarily the best solution. Although a folded dipole has an impedance of 300 ohms, when two folded dipoles are placed within an ⅛ of a wave length of one another, the impedance falls considerably and is probably in the neighborhood of 180 ohms. Thus the 150 ohm cable which I used as the delay line is a fairly good match.

The feed line from the transmitter "looks into" two 150 ohm lines in parallel (one line to each element). Thus a 75 ohm feed line is the perfect match for the feed point into the 150 ohm delay line which in itself is a pretty good match for the two folded dipoles whose impedance has been appreciably reduced by their mutual coupling. This beam, therefore, needs very little adjustment and has a low s.w.r. Clearly, as the beam is a balanced array, it is better to feed it with balanced twin-lead using a balun at the transmitter end. ■

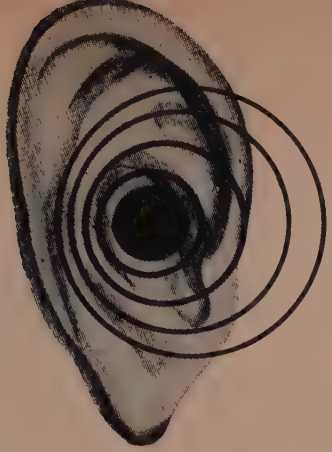
VHF Transistors [*from page 45*]

db at 200 mc which will compete on equal footing with the Nuvistor. The price is still a bargain at some $30.00, however.

The new Texas Instruments Dalmesa series is a popular transistor. Some of these devices, with a several hundred megacycle alpha cutoff frequency, sell for less than 50 cents in manufacturing quantities.

Silicon is a tough nut to crack because of the high processing cost. However most companies, such as Hoffman, Rheem, Pacific Semiconductors, Radio Corporation of America, etc., have a gradeout line of silicon transistors which may be purchased for less than $5.00.

One silicon transistor (not a gradeout) which did not make the list, due to its price tag of $5.60, should also be mentioned. The 2N706 is capable of producing several hundred milliwatts power output on two meters. The price given was for the Texas Instruments 2N706 and should be typical of other manufacturers. ■



the hams at HARVEY say
"YOU CAN HEAR THE DIFFERENCE!"

32S-3

75S-3

THE COLLINS S/LINE

uned to give you the cleanest signal on amateur bands.

OLLINS 32S-3 TRANSMITTER—

his exciting new transmitter by Collins is big ews for the discerning ham . . . it features eyed carrier on CW • Adjustable keying hard- ess control • A zero-beat spotting control ALC • Easier access to patch cords • Side- ne level adjust • For SSB or CW • With the 2S-3 you'll have the cleanest signal on the air.

Amateur Net **$750**

OWER SUPPLY—

16F-2 AC Power Supply—Operates from 115v 50-60 cps. Provides all voltages for the 2S-3

Amateur Net **$115**

75S-3 RECEIVER—

The 75S-3 provides SSB, CW and AM reception between 3.4 and 29.7 mc (except 5.0—6.5 mc)

Features incorporated in the 75S-3 include dual conversion with a crystal-controlled first heterodyning oscillator; bandpass first IF; stable, permeability-tuned VFO; RF amplifier designed to minimize cross modulation products; 2.1-kc Mechanical Filter and 200-cycle crystal filter; both product and diode detectors, rejection notch filter, manual and crystal BFO, and AGC time constant control.

With the new Collins 75S-3, you can be assured of the finest amateur receiver available for reception of CW, SSB, RTTY and AM.

Amateur Net **$680**

FOR FURTHER INFORMATION WRITE TO:

HARVEY RADIO CO., INC.

103 West 43rd Street, New York 36, N. Y. 1 Block from Times Square / JUdson 2-1500

sit our new subsidiary, FEDERAL ELECTRONICS, INC., Vestal, N.Y. for all your industrial needs.

For further information, check number 12, on page 110

JEFF-TRONICS

Pi-Network Loading Capacitor, 5 Sections, each 400 uuf max., total 2000 uuf, 2¾" x 3¼" x 6", ⅜" shaft. 4 pounds. Also good for Audio Oscillator Tuning $2.00

Coupling for above, flexible brass ⅜" to ¼" ..... 35¢

Adjustable audio choke, variable from 2½ to 8½ henrys. 1¼" sq. x 2" high. 900 ohms. Fully cased ..... 79¢

Texas Instruments IN756A Zener reference diodes. 8.2 volts. 400mw. ..... $1.00 each, 4 for $3.00

Audio output trans. 8,000 ohms P-P to 4, 8, 16, 500 ohms, 15 watts. Good response to 15 Kc. 3" x 3½" x 3½". 4 pounds $2.00

Power Transformer, 395-0-395 volts, 200 ma., 5 v, 3A, 6.3V. 3.3A. 3¾" x 4½" x 4". 7 pounds $4.00

Power Transformer, 350-0-350V. 130 ma., 5V. 130 ma., 5V. 3A., 6.3V. 3.6A. Uncased. 3" x 3¾" x 3½". 7 pounds $1.95

Button mica feedthru capacitors: 1000 uuf 500 v dc, solder-in type. 250 uuf 500 v dc, mounts by nut in ⅜" hole. Either type ..... 15¢ each, 8 for $1.00

Filament Transformer, 2 windings each 12.6v. 1 Amp. Can be seriesed for 25.2 v. 1 Amp, or parallel for 12.6 v. 2 Amps. 2¼" x 2" x 2¾". 3 lbs. $1.95

2E25 tubes.....$1.00 6BQ5 / EL84..... $1.00

Filter chokes. 8 Hy. 800 ma. 6000 v. RMS Test oil-filled. 6" x 6¼" x 9½" high overall. 30 pounds $9.50

Filter choke, 16 Hy. 50 ma. Stancor C-1003.....1 pound 75¢

Filter choke, 10 Hy. 150 ma. 2 Kv test. Herm. sealed, 3" x 3½" x 5" ..... 5½ pounds $1.45

1 uf. 3000 v dc. GE Pyranol capacitor. 1¾" x 3¾" x 4½" ..... 2 pounds 95¢

Please add ample postage, and in Ohio, add 3% sales tax. Any excess is refunded.

Send for our catalog full of useful buys.

4791 Memphis Ave.
Cleveland 9, Ohio

For further information, check number 14, on page 110

YOU BE THE JUDGE

WRL WRL

TWO WEEK TRIAL OFFER

MONEY BACK GUARANTEE

SHIPPED POSTPAID

FACTORY WIRED

WRL

METEOR SB-175 TRANSMITTER

$99.95 Less P.S.

ALL MODES MOBILE – FIXED

175W-CW — 100W-AM — 140W (PEP) DSB

A simple "flick of the switch" for 75 watt novice power. Don't let high cost rigs kill your hobby -- try WRL's high powered, low cost, 175 watt transmitter for 2 weeks. You must be 100% satisfied, or return postpaid for full refund. Terms: No money down -- $5.00 per month.

WRL WORLD RADIO LABORATORIES, Inc.
3415 W. BROADWAY • COUNCIL BLUFFS, IOWA

For further information, check number 15, on page 110

Contest Calendar [from page 51]

can contact.

Check last month's CALENDAR for log information and frequencies.

Logs go to: Stanley J. Belliveau, W7AYO Box 6144, Riverton Hgts., Seattle 68, Washington.

YL/OM

Phone

Starts: 1800 GMT Saturday, March 2nd
1 P.M. EST Saturday, March 2nd
Ends: 0500 GMT Monday, March 4th
12 M. EST Sunday, March 3rd

The C.W. section is on March 16-17, the times correspond to the above. Louisa Sando W5RZJ gives you full details in her YL column on page 68 this issue.

VHF Amateur

Starts: 9 A.M. Local time, Sat., Mar. 16
Ends: 9 P.M. Local time, Sat., Mar. 16

This contest is a shorty, only 12 hours duration, with new rules and scoring system. Bob Brown, K2ZSQ tells you all about it on page 71 this issue.

Pakistan DX

Starts: 0000 GMT Saturday, March 23rd.
Ends: 2400 GMT Saturday, March 23rd.

The Pakistan DX Contest will be held on March 23rd each year in celebration of its Republic Day.

The contest is sponsored by the newly organized Tigers Amateur Radio Club, with the object of giving outside stations an opportunity of working stations in both East and West Pakistan.

Falling on the same date as the ARRL DX contest creates quite a problem but Mr. Mohd president of the club feels that this problem will only exist this year and that future contests will have a free date.

1. Activity is limited to the 7 and 14 mc bands only. (Why?)

2. Both C.W. or Phone or mixed contacts will count.

3. Serial numbers will consist of four and five figures, RS or RST report plus your Zone number. (Same as *CQ* contest.)

4. Each completed contact with an AP station counts 3 points, incomplete contacts 2 points.

5. The same station can be worked twice once on each band.

6. Although logs are solicited for the entire 24 hour period, only contacts made during a continuous 12 hour period will count.

7. A certificate will be awarded to the single operator scoring the most contact points in each country and each call district in countries or large areas. (USA, Canada, Australia and *etc.*) Awards will also be made to the leaders in each Zone. A single operator having the highest score both in his country and zone will be awarded a special certificate. (From the above it would

COPIES AVAILABLE NOW

The New CQ Anthology II...

Covering 1952 Thru 1959

- ***250 Pages, Plus***
- ***75 Top Articles***

Featuring

SECTION I . . . Improving Equipment

SECTION II . . . VHF

SECTION III . . . SSB

SECTION IV . . . Surplus

SECTION V . . . Mobile

SECTION VI . . . Transmitters & Receivers

SECTION VII . . . Theory

SECTION VIII . . . Operating

SECTION IX . . . Test Equipment

SECTION X . . . RTTY

SECTION XI . . . Amateur History

Including:

- A Poor Ham's Power Plant. *By Boelke*
- Converting the BC-603 For Six. *By Grayson*
- Ham TV. *By Stoner*
- Converting The ARC-4 For Two. *By Wood*
- Why And How On Six. *By Burdine*
- DX-100 Modernized For SSB, AM And CW. *By Mitchell*
- Second Guessing The Experts on The HQ-129X. *By Santangelo*
- DX-35 Improvements. *By Haburton*
- Converting The BC-659. *By Grayson*
- Filter Alignment Equipment. *By Scherer*
- SSB: Is It Really Better Than AM? *By Costas*
- Teletype Without Tears. *By Wells*
- Transistorized VFO. *By Scherer*
- An Unusual SSB Modulator. *By Orr*

C-2

CQ BOOK DEPT.
300 West 43 St.
New York 36, N. Y.

☐ Anthology I $2.00

☐ Anthology II $3.00

☐ I enclose $..... for the items checked above. Please mail post-paid to:

Name .....

Address .....

City ..... Zone..... State.....

N. Y. City Residents Add 3% Sales Tax.

GUARANTEED CRYSTALS!

ALL MARINE FREQ.-FT-243, DC-34 Holders. Tol. .005. $2.50
POLICE, C.A.P., CD, MARS. Tol. .01% $2.00
CITIZENS BAND—11 METERS—.005% Tol.
26.965 to 27.225 MC, 3rd Over. Herm. Seal or FT-243 $2.95
13.4825 to 13.6125 MC, 2nd Harm.Herm. Seal or FT-243 $2.95
6741.25 to 6806.25 Kc, 4th Harm. FT-243 only $2.50

SPECIAL! STOCK CRYSTALS

FT-243 Holders 5700 KC to 8700 KC in steps of 25 KC's

$1.19 ea.

SEND FOR FREE CATALOG

DC-34 Holders 1690 KC to 4400 KC steps of 10 KC ea $1.19

NOVICE BAND FT-243 Fund. 1.49 ea.

80 Meter 3701-3748—Steps of 1 KC. FT-243
40 Meter 7150-7198—Steps of 1 KC. FT-243
Dbl. to 40 Meter 3576-3599. Steps of 1 KC. FT-243
15 Meter 5276-5312—7034-7083 Steps of 1 KC. FT-243

FT-243—2 Meters (Steps of 1 KC) $1.49
FT-243—6 Meters (Steps of 1 KC) $1.49
FT-243—From 3000-4000 ..... $1.49
FT-243—From 1005-2999 (Steps of 5 KC) $2.50
FT-241 SSB Low Freq. Xtals 370 to 540 KC (Steps of 1.852 and 1.388) ..... $ .69
FT-241 SSB Matched Pairs $2.39

Include 5c per crystal for postage (U. S. Only) Calif. add 4% Tax. No C.O.D.'s. Prices subject to change. Ind. 2nd choice; substitution may be necessary. MIN. ORDER $2.50

"The House of Crystals"

U. S. CRYSTALS, Inc.

1342 S. La Brea Ave. Los Angeles 19, Calif.

For further information, check number 16, on page 110

FREE GIANT NEW 1963 CATALOG

BURSTEIN-APPLEBEE CO.

SEND FOR IT TODAY FREE

Dept. CQ, 1012 McGee St., Kansas City 6, Mo.
☐ Rush me FREE 1963 B-A Catalog.
Name .....
Address .....
City ..... State .....

For further information, check number 17, on page 110

Contest Calendar [*from page 88*]

seem that competition is limited to single operators.

Mailing deadline is March 30th and it is requested that 12 IRCs be included with each log entry.

Your logs go to: The Awards Manager, Mr Mohd, AP5CP, Tigers Amateur Radio Club Dacca Signals, Dacca 6, East Pakistan.

CQ WW SSB

Starts: 1200 GMT Saturday, March 30th.
Ends: 1800 GMT Sunday, March 31st.

Dorothy and Irv gave you all the details in their SIDEBAND Column, page 71 last month. This is the 7th annual SIDEBAND contest and the 6 hour rest period is still required. You are only permitted to operate 24 hours out of the 30 hour contest period. Better check the SIDEBAND column for details.

R E F

C.W. March 30th and 31st.
Phone April 20th and 21st.

Starting time 1400 GMT Saturday and ending 2200 GMT Sunday in each instance. Rules next month.

Helvetia 22

Starts: 1500 GMT Saturday, April 6th.
Ends: 1700 GMT Sunday, April 7th.

Once again the HB boys promise to activate some of the rare Cantons so that it will be possible for you to finally qualify for the very attractive H22 Certificate. Contest rules next month.

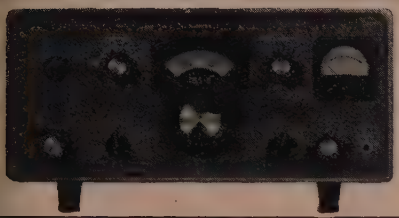
[*Continued on page 109*]

Overtone-Harmonic [*from page 31*]

are adjusted for best average overall gain in the converter over the whole two meter signal range. A diode noise generator or test signal generator can be used for this purpose while tuning the main receiver over the range between 14 and 18 mc, corresponding to r.f. signal inputs between 144 and 148 mc. The grid leak-condenser in the r.f. stage is only for tube protection when using a high powered transmitter nearby.

The mixer plate circuit is coupled to the main receiver thru a fixed tuned pi circuit consisting of a small 17 to 20 microhenry peaking coil and two capacitors. The ratio of these capacitors should be 5 or 10 to 1 between the low impedance side and the plate or high impedance side. The 3 mmf capacitor plus tube output capacitance *etc.* add up to about 5 or 6 mmf. A two or three foot length of RG-59 U coax line from the converter to the receiver will form the larger capacitance of the pi circuit. If the lead is shorter than this a small capacitor can be connected across the output jack to build up the capacity to aroun

Here is the reason WE CAN OFFER YOU the radio industry's absolutely LOWEST FINANCING COST on your new COLLINS EQUIPMENT!



- ✓ 5% Maximum Finance Rates*
- ✓ 10% Down Payment
- ✓ Take 1 or 2 Years to Pay
- ✓ 6 Months Pay Off Option

COLLINS 75S 3 RECEIVER
HAM NET PRICE $680
Only 10% down — and just $28.04 a month puts this superb Collins Receiver in your shack! (2 years)

We talked with a lot of bankers to bring this new low cost finance plan to Collins buyers. Finally we located an old established, conservative bank in northern Wisconsin. They've agreed to finance our sales of Collins gear without trade-ins at a maximum interest rate of only 5% . . . with just 10% down. You can't beat this deal! Take 1 or 2 years to pay the balance . . . FULL CREDIT for all finance charges if you decide to pay the balance anytime in the first six months! Important: this offer applies only to sales without trades. Order now . . . immediate delivery . . . plus our rock bottom low finance costs!

10% DOWN DELIVERS ANY NEW COLLINS GEAR

The following 1 and 2 year payment terms apply after 10% Down Payment

	Amateur Net	1 yr.	2 yrs.
30L-1 Linear Amplifier	$ 520.00	$ 40.95	$21.45
30S-1 Linear Amplifier	1556.00	122.53	64.18
32S-3 Transmitter	750.00	59.06	30.93
62S-1 VHF Converter	895.00	70.48	36.91
75S-3 Receiver	680.00	53.55	28.05
75S-3A Receiver	750.00	59.06	30.93
KWM-2 Transceiver	1150.00	90.56	47.43
KWM-2A Transceiver	1250.00	98.43	51.56
51J-4 Receiver	1464.00	115.29	60.39
51S-1 Receiver	1828.00	143.95	75.40
351D-2 Mobile Mount (KWM-2)	120.00	9.45	4.95
MP-1 14V DC Power Supply (KWM-2)	198.00	15.59	8.16
PM-2 Portable Power Supply (KWM-2)	150.00	11.81	6.18
CC-2 Carrying Case	85.00	6.69	3.50
CC-3 Carrying Case	107.00	8.42	4.41
516F-2 AC Power Supply (32S/KWM-2)	115.00	9.05	4.74
312B-4 Speaker Console (S-Line, KWM-2)	195.00	15.35	8.04
312B-5 PTO Console (KWM-2)	350.00	27.56	14.43
399C-1 PTO Speaker (KWM-2)	164.00	12.91	6.76
TD-1 Antenna	152.00	11.97	6.27

Three year financing available with 25% Down Payment
WRITE FOR LATEST BULLETIN OF RECONDITIONED COLLINS EQUIPMENT

This Low Finance rate applies only to new Collins Equipment purchased without a Trade-in. Offer is subject to withdrawal without notice.

NEED CASH?

We'll buy your ham gear for spot cash. Tell us what you have to sell and we'll rush our offer.

FACTS ON FINANCING

The terms shown here on this page apply to new Collins equipment only when purchased without trade-in. For some unknown reason, this bank does not like to handle transactions involving trade-ins. If you do have a trade-in, we can offer you one of the best trade-in deals in the industry and our conventional finance plan, which is competitive. BUT: If you don't have a trade-in, for heaven's sake, take advantage of this low interest rate while the bank has lots of extra money to invest.

AMATEUR ELECTRONIC SUPPLY

Two Stores to Serve You
PLEASE SEND MAIL ORDERS TO MILWAUKEE STORE

3832 W. LISBON AVE.
Phone WEst 3-3262
MILWAUKEE 8, WISC.

IMPORTANT: Send all mail orders and inquiries to:
Amateur Electronic Supply
3832 W. Lisbon Ave., Milwaukee 8, Wisconsin

Ship me .....

I enclose .....: I will pay the balance in

☐ 1 year ☐ 2 years ☐ 3 years

If new account—enclose credit information—see page 108.

I want to buy .....and want to trade

.....What's your deal?

Name .....

Address .....

City .....Zone.....State.....

☐ Send reconditioned equipment bulletin and more information about your firm.

For further information, check number 20, on page 110

DOW-KEY DK60 SERIES

4 VERSATILE MODELS A.C. or D.C.

COAXIAL RELAYS

Also Available with Type C, TNC, BNC, N & UHF Connectors

Outstanding favorite for amateurs . . . Versatile combinations for industrials! Low VSWR — less than 1.15:1 from 0 to 500 mc. LOW LOSSES . . . High Contact Pressures. LOW CROSS-TALK through use of patented "isolated connector" arrangement. HIGH POWER RATING. All coils encapsuled in epoxy resin for quieter operation and resistance to moisture.

- ★ UNCONDITIONAL GUARANTEE for one year. (We will repair if faulty within 1 year.)
- ★ See one of our 700 dealers and distributors in U. S. and Canada for catalog sheets or write:
- ★ Weatherproof models available at slightly higher cost.
- ★ Ganged, multiple position switch arrangement available for remote control selection of antennas.

STANDARD RELAYS: DK60, DK60-G, DK60-2C and DK60-G2C —

PRICED FROM $12.45

DOW-KEY COMPANY

Thief River Falls, Minnesota

For further information, check number 18, on page 110

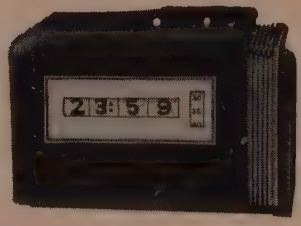
The NEW TYMETER©

"Time at a Glance"

24 HOUR CLOCK

#300-24H MODERNE

$15 Plus Applicable Taxes



Ebony or grey plastic case. H3¾", W5⅝", D3¼". Wt. 3 lbs. Self starting electric. 110V 60cy. A.C. Guaranteed 1 Year. UL approved motor and cord.

At Your Dealer, or WRITE TO

TYMETER ELECTRONICS

PENNWOOD NUMECHRON CO.

7249 FRANKSTOWN AVE., PITTSBURGH 8, PA.

HAVE YOU SEEN PAGE 6

50 mmf. If larger capacities are used with a smaller peaking coil to resonate at the middle of the r.f. range, the mixer output will not have as good a bandwith. The values used in fig. 3 produce a fairly flat 4 mc bandwidth.

The converter has the same noise figure as one with two 5842/417A triodes in a cascode stage and a triode-mixer converter in comparison tests with a diode noise generator. The 5842 tubes were in reasonably good condition in a converter normally used for two meter DX work. ■

Auto RTTY & C.W. [*from page 35*]

(receiver front panel mount) to the desired "hang" time.

To operate RTTY it is only necessary to operate a push button. The push button is mounted near the keyboard as explained earlier. Pushing the button to transmit mutes the receiver, throws the antenna relay to transmit, turns on the transmitter, and shorts the input to the RTTY Terminal Unit. To identify by c.w., push the button and c.w. identify with the paddle or by automated c.w. The circuit is very simple and for either c.w. or RTTY performs with out distressing the operator by clicking noises during transmit-receive transition.

Many possibilities for further development of the system have been worked out on paper and will be incorporated as the needs arises. This system is not limited to the use of multi-gates. Other devices that function as transmitter-distributors may be used equally well. The tricks performed by the many electro-mechanical teletypewriter devices incorporated into amateur design are limited only by the ingenuity of the designer and the degree of desire to create. ■

Tunnel Dipper [*from page 36*]

the dial scales. Convenient storage space is provided in the cover for the six inductors which are used for the following ranges: 3-7 mc, 5-13 mc, 12-32 mc, 30-90 mc, 80-160 mc and 150-260 mc.

Nearly all of the Tunnel Dipper components and circuitry are wired on a small printed-circuit board which eventually is mounted at one end of the instrument on a sub-chassis framework; so, together with the instructions, assembly and wiring is easily accomplished. Construction time involves 3½ to 5 hours.

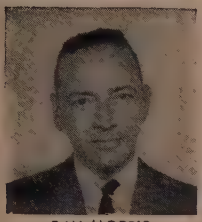
Some Hints

It is suggested that during the construction, the diode leads on the component-side of the circuit board be left long to permit being held by a pair of long-nose pliers.

On page 21 step 3: before the battery bracket is mounted, it will be best in increase the size of the chassis hole to 5/16" or 3/8" next to the positive terminal of the bracket. This will reduce the possibility of a short circuit at this point later on.

When the tuning capacitor is to be mounted, as described in the last three steps on page 21, it will be best to first follow these steps *without*

LOOKING FOR SERVICE?
AMATRONICS, INC.
HAM SERVICE HEADQUARTERS



RAY MORRIS
W2QYS

LET'S FACE IT . . . We all expect top performance from our gear. When the rig and receiver are perking along just right we can enjoy our hobby to the utmost. The DX comes a little easier and all is right with the world.

BUT . . . Unfortunately there are times when the equipment will develop a few bugs. Most of us do not have the test instruments or the time to do the de-bugging, ourselves. This is where Amatronics fits into the picture.

AMATRONICS . . . Has the facilities, know-how and personnel to handle your servicing problems. We are all Hams. . . . We know the business. . . . We speak the language.

LOU ARMAGNO
WA2JBG

Authorized Warranty Station

- Hallicrafters • Globe • RME
- National Radio • Hammarlund
- Civil Defense service and maintenance
- Complete receiver alignment service
- Complete transmitter servicing facilities
- Modifications and "up-dating"

JIM O'BRIEN
K2UDP

Pick-Up and Delivery Service

- Available in the Metropolitan New York, Long Island, New Jersey area at no charge
- This service also available to the "in-warranty" customer at a very nominal fee
- When shipping equipment to us please use Railway Express motor freight, or air freight (pre-paid
- Please pack carefully. If in doubt about shipping contact us.

AMATRONICS INC. 91-46 Lefferts Blvd. Richmond Hill 18, New York Telephone (212) HI-1-7890

For further information, check number 32, on page 110

"HOW TO MAKE MONEY IN Mobile Radio Maintenance"

AUTHORITATIVE GUIDEBOOK
ABOUT THE BOOM IN TWO-WAY MOBILE-RADIO:
GIVES FACTS, FIGURES, PAY RATES.
WRITE TODAY!

FREE

LAMPKIN LABORATORIES, INC. Electronics Div. BRADENTON, FLA.

LOOKING FOR A TOWER?

Write today for the all-new TRISTAO catalog. A completely new concept in tower design for all amateur applications. TRISTAO—an old name in tower design with a new style and a brand new line.

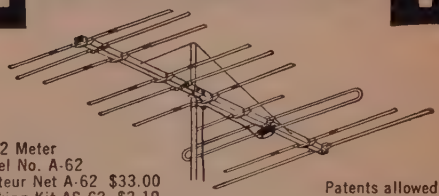
TRISTAO Towers, Inc.
242 South J St., Dept. CQ-2, Tulare, California

WANTED Transistors, Tubes all types, Test Equip., Ground Equip., PRC, GRC, TS, URM, UPM, Aircraft Communications & Navigation Equip. **ELECTRONIC TUBES** — Industrial, Special Purpose, Receiving-TV, Transistors-Diodes. **LAB. TEST EQUIPMENT, AIRCRAFT & GROUND, COMM. EQUIPMENT, INTERNATIONAL SERVICE.** Write or Phone

V & H RADIO
2053 VENICE, L. A. 6, CALIF.
RE 5-0215

HAVE YOU SEEN PAGE 6

2 ANTENNAS IN 1



6 & 2 Meter
Model No. A-62
Amateur Net A-62 $33.00
Stacking Kit AS-62 $2.19

Patents allowed and pending

The Only Single Feed Line
6 and 2 METER
COMBINATION YAGI ANTENNA
another first from **FINCO®**

ON 2 METERS
18 Elements
1 — Folded Dipole Plus Special Phasing Stub
1 — 3 Element Colinear Reflector
4 — 3 Element Colinear Directors

ON 6 METERS
Full 4 Elements
1 — Folded Dipole
1 — Reflector
2 — Directors

See your FINCO Distributor
or write for Catalog 20-226

THE FINNEY COMPANY
Dept. 19 Bedford, Ohio

For further information, check number 33, on page 110

BARRY ELECTRONICS
February Specials

Ceramic Mobile Microphone: Grey cast metal case with SPST switch for push to talk. 5 ft., 4 cond. coil cord & Amphenol MC4M connector, and mtg bracket included. Similar to Turner SR9 and Shure 405. ..... **$7.95**

4X150A Power Tetrode Tubes: New JAN late 1959-1960 product. Made by **RCA.** Unused. **$11.50**

Eimac 4X150A/4010 Air System Socket: With built-in By-Pass Capacitors. R/E. A regular **$12.00** value for only **$6.95**

115 VAC/60 CPS Fan Blower with Blade. Suitable for small xmtg tubes & table top relay rack operation. **$2.95**
Berkshire Plate Choke: 5 Hy. @ 600 Ma. 30 Ohms. **$3.95**

Eimac Double Contact Finger Stock. 2⅛" W. x 3' L. **$3.00/3'.** UTC #63833 Pwr Xfmr: 250 VCT @ 250 Ma. 5 VCT @ 2 Amps. **$2.50**

3 KW RF Dummy Load. 50 Ohms imped. Mfd by **Bird.** **$55.00**

Sony Fabulous Micro TV (5" Picture). 8 lbs. Call or write for details.

Johnson Viking Ranger. Factory wired. **$175.00** (demonstrator)

Gonset Communicator IV. (2 meters). **$250.00**

Gonset G-66 Mobile Recvr. 115 VAC with 6 VDC Mobile Supply. **$145.00**

Gonset G-28 50 Watt 10 Meter Communicator. **$199.00**

Hammarlund HQ105TR Transceiver. **$219.50**

RME 6900 SSB/AM/CW Receiver. Write for highest trades.

RME DB23 5 Band Preselector. **$39.00**

Cornell-Dubilier Ham M and AR-22 Rotators in stock. Write.

Highest Trades offered towards **Clegg** 99'ers, Zeus Xmtr, Interceptor VHF Recvr. Latest Edition **Radio Amateur Call Book** USA @ **$5.00,** Foreign @ **$3.00.** ARRL publications and log books in stock.

MC Jones #706N Micromatch. 50 Ohms. 20 to 1,000 Mcs. Full scale: 400 Watts. Brand new. **$95.00**

In stock: B & W, Clegg, C.D., Dow-Key, Drake, Glas-Line, Hammarlund, Johnson, Electro-Voice Mikes, **Mosley, National, Siemens, RME, Stancor, Tri-Ex, Waber, Westinghouse, Waterman.** Excellent trade-ins offered.

LARGEST DIVERSIFIED TUBE STOCK IN USA (Xmtg, Special-Purpose, TV/Radio/Hi-Fi/Industrial Tubes & Semiconductors). Only first quality. Finest name brands @ Sensible prices. Tube Headquarters of the World: (Separate Export Dept. handles all Overseas Orders). Before you buy, check with **Barry.** Quotations answered same day.

BARRY ELECTRONICS **Dept. C-2**
512 BROADWAY, NEW YORK 12, N. Y.
WALKER 5-7000 (Area Code: 212)

☐ Enclosed is money order or check and my order. Prices FOB, NYC. Shipments over 20 lbs. will be shipped collect for shipping charges. Less than 20 lbs., include sufficient postage. Any overage will be refunded. Fragile tubes shipped via Railway Express.

☐ Send copy of new 1963 "Green Sheet" Catalog.

☐ Send information on: .....

☐ I have available for trade-in the following: .....

.....

Name ..... Title

Company .....

Address .....

City ..... State.....

For further information, check number 19, on page 110

the installation of the dial drum on the capacitor shaft to make certain that there will be no misalignment and binding at the panel bushing as was experienced in our case. If this does occur, the bushing hole in the battery bracket and in the chassis should be enlarged to the point where proper alignment can be realized without distortion of the chassis framework and the circuit board. After this is done, remove the capacitor, install the dial drum as instructed, then remount the capacitor.

After the unit was completed, with the dial drum positioned on the capacitor shaft, the calibration was found to be considerably off over much of the range. This was corrected by resetting the dial drum for the lowest average percentage of deviation when the frequency of the instrument was checked with WWV at 5 and 10 mc and at accurately known points on the amateur bands. Accuracy was then $\pm 3\%$, except on the highest range where it was $\pm 5\%$.

It was also found that the setting of the SENSITIVITY control is so critical that it is difficult to maintain on-scale meter readings. Much smoother control can be realized by adding three resistors as shown in fig. 1. They should be soldered directly to the terminals of R_4, so no modification on the circuit board will be required.

During dipper use, meter operation is smooth with no undue variations except for a gradual drop off at the low frequency end of each range. Pronounced dips are obtainable when the instrument is coupled to resonant circuits.

The Assembly Manual contains tunnel-diode theory as it relates to the instrument, applications and operation of the HM-10A and a trouble-shooting chart. One of these points out that some drift in the meter reading is normal in the first few minutes of operation until the transistors reach thermal equilibrium. Besides this, it was noted that drift is also experienced due to variations in environmental temperature as the instrument is moved from place-to-place; drifting upward as the temperature drops, and downward as it rises.

The Manual also cautions against using the Tunnel Dipper (osc. position) in a strong r.f. field to prevent possible damage to the tunnel diode.

The model HM-10A sells for $34.95, a reasonable price considering its advantages. ■

Sideband [*from page 57*]

If you're going with a group, be sure to so indicate on your ticket request so that proper seating arrangements can be made. Don't delay—make your plans today and send for your tickets right away.

Sideband Around The World

Stan, VP4TI—if you read this, please listen for George, K6MLS; he's been looking for you for *four* years! . . . How many of you knew that Goldie, K9AXS, is the mother of Carole, K9AMD, one of hamdom's leading writers? We didn't until we met Goldie in a recent YL con-

Hey Terry—Help! Our deal on Halicrafters new SR 150 is so good I'm running out . . . RUSH MORE OF 'EM!

NEW TRUCKLOAD JUST CAME IN! KEEP RIGHT ON MAKING OUR FANTASTIC TRADE-IN DEALS!

Doc—
W9HJS
Mgr. Chicago Store

$5 DOWN UP TO 3 YEARS TO PAY ON ALL HALLICRAFTERS GEAR

Terry—W9DIA

Yes, we have the new SR 150

The big noise in ham radio is this new Hallicrafters Fixed/Mobile Transceiver—150 Watt PEP on SSB—125 WATTS on CW. Ham net $650—just $5 down! AC Power Supply, $99.50; DC Power Supply, $109.50.

Get our trade in deal on this or any Hallicrafters Equipment

NEW HALLICRAFTERS EQUIPMENT

	Amateur Net Price	Monthly Payments
CRX-1 30-50MC Receiver	$ 99.95	$ 3.42
CRX-2 151-174MC Receiver	109.95	3.79
CRX- 3108-135MC Receiver	94.95	3.24
FPM-200 Transistorized Transceiver	2,650.00	95.51
HA-1 "To" Keyer	79.95	2.70
HA-2 2 Meter Transvertor	349.50	12.44
HA-5 80-2 Meter VFO	79.95	2.70
HA-6 6 Meter Transvertor	349.50	12.44
HA-10 Tuner	24.95	.76
HTHT-32B SSB Transmitter	725.00	26.00
HT-33B Linear Amplifier	995.00	35.75
HT-37 SSB Transmitter	495.00	17.69
HT-40 AM-CW Transmitter	109.95	3.79
HT-40K Kit form of above	89.95	3.07
HT-41 Linear Amplifier	395.00	14.08
P-26 Supply for Transvertors	99.50	3.41
R-47 Speaker	12.95	.29
R-48 Speaker	19.95	.54

	Amateur Net Price	Monthly Payments
S-108 General Coverage Receiver	$ 139.95	$ 4.87
S-118 General Coverage Receiver	99.95	3.42
S-119 General Coverage Receiver	49.95	1.62
S-119K Kit form of above	39.95	1.26
S-120 General Coverage Receiver	69.95	2.35
SR-150 Fixed/Mobile Transceiver	650.00	23.29
P-150AC Supply for SR-150	99.50	3.41
P-150DC Supply for SR-150	109.50	3.77
MR-150 Mobile Mount for SR-150	39.95	1.26
SX-62A FM & Short Wave Receiver	430.00	14.08
SX-100 General Coverage Receiver	325.00	11.56
SX-101A Ham Band Receiver	445.00	15.89
SX-110 General Coverage Receiver	169.95	5.86
SX-111 Ham Band Receiver	279.50	9.91
SX-115 Ham Band Receiver	599.95	21.48
SX-117 Ham Band Receiver	379.95	13.54
SX-140 Ham Band Receiver (80-6)	124.95	4.33
SX-140K Kit form of above	104.95	3.61

HALLICRAFTERS RECONDITIONED EQUIPMENT

RX-2 Recv.	$ 74.00	SX-62 Recv.	$149.00
A-5 VFO	59.00	SX-71 Recv.	119.00
-20R Recv.	49.00	S-76 Recv.	79.00
X-25 Recv.	59.00	S-77A Recv.	49.00
X-28 Recv.	99.00	S-85 Recv.	79.00
T-31 Linear	129.00	SX-96 Recv.	159.00
T-32 Xmtr.	369.00	SX-99 Recv.	89.00
T-33A Xmtr.	429.00	SX-100 Recv.	189.00
T-33A Linear	399.00	S-106 Recv.	39.00
T-37 Xmtr.	349.00	S-108 Recv.	89.00
-38E Recv.	34.00	SX-110 Recv.	119.00
T-40 Xmtr.	64.00	S-119 Recv.	29.00
-40 Recv.	49.00	S-120 Recv.	39.00
-40A Recv.	59.00	SX-140 Recv.	79.00
-40B Recv.	69.00		
X-42 Recv.	139.00	CITIZENS BAND	
X-43 Recv.	89.00	CB-1 Transcvr.	59.00
-53 Recv.	49.00	CB-3 Transcvr.	89.00

NEED CASH? We'll buy your ham gear for spot cash. Tell us what you have to sell and we'll rush our offer.

STAY ON THE AIR PLAN

Yes—Now you can enjoy your new Hallicrafters equipment without going off the air. You need not ship your trade-in in to us until you receive our shipment, and make sure that your new merchandise is in good working condition.

INFORMATION ON FINANCING

Only $5.00 down is required for any New Hallicrafters Equipment. 10% is required for reconditioned equipment. Payments shown on new equipment are for a 36 month plan. A $60 order for either new or used equipment, may be financed up to one year, two years on a $120 order, or three years on $180 order. If you do not already have one of our Credit Cards, to speed your order you should supply us with the credit information when you send in your down payment. See page 108 of this magazine. Persons purchasing on our time payment plan must be of 21 years of age and regularly employed. Service men with APO addresses with good credit ratings, accepted.

AMATEUR ELECTRONIC SUPPLY

THREE STORES TO SERVE YOU

Please send mail orders to Milwaukee Store

3832 West Lisbon Ave., Milwaukee 8, Wis. • PHONE WEST 3-3262

CHICAGO 31, ILL.
6450 Milwaukee Ave.,
PHONE RO 3-1030

ORLANDO, FLORIDA
23 Azalea Park
Shopping Center, Phone 277-8231

Send all mail orders and inquiries to
AMATEUR ELECTRONIC SUPPLY
3832 W. Lisbon Ave., Milwaukee 8, Wisc.

Ship me .....

I enclose ..... ; I will pay the balance in

☐ 1 year ☐ 2 years ☐ 3 years

If new account — enclose credit information — see page 108 for details.

I want to buy ..... and want to trade

..... What's your deal?

Name .....

Address .....

City ..... Zone State .....

☐ Send reconditioned equipment and sale bulletin.

B&W

TR SWITCH

(TRANSMIT/RECEIVE SWITCH)

MODEL 381B

An electronic antenna changeover switch. Transmitter is continuously connected to antenna, antenna circuit to receiver is blocked during transmit. No switch contacts to arc or burn. Switching is instantaneous. Selectable band-switching insures no loss in receiver sensitivity. Substantial gain in receiver sensitivity results in most installations. Ideal for break-in operation on CW, SSB and AM. Bandswitch conveniently located on front. Three coax connectors are mounted on rear. Conservatively designed for full legal power. Operates from 115 volts, 60 cycles. For 52-75 ohm lines.

Size 4¾" x 4" x 5½"

BARKER & WILLIAMSON, Inc.

Radio Communication Equipment Since 1932

BRISTOL, PENNSYLVANIA • STillwell 8-5581

For further information, check number 41, on page 110

Are You

TRADING?

Let me make you a trade-in offer on your used amateur equipment. All name-brand merchandise—late serial numbers assured. Quick delivery.

WRITE TODAY!

Bill W9ZSO-KØIUH

COMMUNICATIONS EQUIPMENT CO.

518 State St., LaCrosse, Wis.

Phone 4-7373

ALL BAND TRAP ANTENNA !

Reduces interference and Noise on All Makes Short Wave Receivers. Makes World Wide Reception Stronger. Clearer on All Bands!

For ALL Amateur Transmitters. Guaranteed for 500 Watts Power for Pi-Net or Link Direct Feed. Light, Neat, Weatherproof.

Complete as shown total length 102 ft. with 87 ft. of 72 ohm balanced feedline, Hi-impact molded resonant traps. (Wt. 8 oz. 1" x 5" long). **You just tune to desired band** for beamlike results. Excellent for ALL world-wide short-wave receivers and amateur transmitters. For NOVICE AND ALL CLASS AMATEURS! NO EXTRA TUNERS OR GADGETS NEEDED! Eliminates 5 separate antennas with excellent performance guaranteed. **Use as Inverted V for all band power gain.** NO HAYWIRE HOUSE APPEARANCE! EASY INSTALLATION! Complete Instructions.

80-40-20-15-10 meter bands. Complete $14.95
40-20-15-10 meter bands. 54-ft. ant. (best for swl's) 13.95
20-15-10 meter bands. 24-ft. antenna 12.95

SEND ONLY $3.00 (cash, ck., mo) and pay postman balance COD plus postage on arrival or send full price for postpaid delivery. Free information available only from:

WESTERN RADIO • Dept. AC-2 • Kearney, Nebraska

test . . . John, GM3KAI, has the distinction, among others, of being the only sideband station in his county in southeast Scotland . . . A little judicious questioning disclosed the fact that the family of Tom, GD3ENK, has lived on the Isle of Man for the past 450 years . . . Robby, VQ4ERR, is rightfully proud of the fact that he was awarded a special medal by the Belgium government for his part in handling important information during the crisis in the Congo . . . When you're in Birmingham, Alabama, be sure to stop in and visit the new art gallery organized by Grit, wife of Bill, W4PR. We hear that it has become one of Birmingham's most popular meeting places . . . It was very interesting to listen to Bert, GI4RY, describe his village as composed of 99 people; there were 100 people there five years ago but someone left! . . . Howard, HI8XHS, is with the Southern Baptist Missionaries and served in Colombia and Ecuador before coming to Santo Domingo where he recently got on sideband . . . Dave, ex-DL4QF, is now W7AQK, and is studying business administration at the University of Arizona in Tucson . . .

It was grand to chat with Dr. Charles, W2CPI, who with wife Adele and daughter, Honey, finally got down to South America for six weeks just before the New Year. We caught up with Charles in Brazil where he was enjoying to the fullest the generous hospitality of the PY hams . . . Tommy, K4SDC/CN8, is now CN8AW and is in charge of okaying Moroccan licenses for American personnel. A retired Naval officer, Tommy and his family are comfortably settled on a farm outside of Casablanca . . . His many friends in the States will be delighted to learn that Harry, ZS2HX, and wife Thelma, became the proud parents of a baby girl, Elana-Gail, on Dec. 1. Our best wishes to the happy family . . . Many thanks to Mac, W5HCZ/VO2, Mars Director at Goose Bay, and the other operators for forwarding the beautiful new "Certificate of Appreciation" for handling traffic for the servicemen in Labrador; we're proud to put this one up in the shack.

With a deep bow in the direction of Al, K1IXG, we bring you some late news of Bob, W1ZZK, of Marion, Conn. According to Al, "there was a 'pipeline' between Connecticut and Rio de Janiero for several years between W1ZZK and PY1FO. Two or three evenings a week, Bob would study Portuguese as taught by the Brazilian sidebanders; they, in turn, would receive English lessons. Many other amateurs would monitor the frequency improving their linguistic ability and offering encouragement to Bob. Though he is still searching for a YL to be his XYL, Bob stays quite busy as DX Editor of the *Nutmeg News*. This very active sidebander is still also searching for one card—the one that will give him 300 on the DXCC list."

Now that the holidays are over and we are well into the New Year, we hope that your station is what you want it to be and that your signal reaches everywhere you want it to be heard.

73, Irv and Dorothy

Surplus Specials At SELECTRONICS

RECTIFIER POWER SUPPLY
t: 115V 60 cy. 1.2 amps.
ut: 115VDC .680 amps.
. Wt., 30 lbs.
No. C-6608 ..... $9.95

GENERAL PURPOSE
tary type BC-1086
t: 115V 60 cy. 1 phase
ut: 300 VDC @ 140 ma
VDC @ 30 ma (VR tube regulated)
DC @ 5 ma
contains a 3 tube servo amp. All on
ce rack mounted chassis, panel is 19"
¼". Also contains a 2" sq. 15 ma DC
el meter. By removing the servo amp.
changing the power supply to capaci-
input, it will deliver 500 VDC @ 150
BRAND NEW. Shpg. Wt., 100 lbs.
No. C-6424 ..... $12.95

BC-221 POWER SUPPLY
t: 115V 60 cycle 1 Ø
ut: 150 VDC @ 25 ma
V AC @ 2 amps.
g Wt., 20 lbs. Cat. No. C-6682 ..$12.95

RDZ POWER SUPPLY
Power supply. Mfg. for the Mars for
Z receiver.
t 115 VAC 50/60 CY. Output 300
@ at 200 Ma. well filtered thru two 8
200 ma. chokes and two 10 mfd 600
caps. Also has a 150 VDC supply thru
R 150. 6.3 VCT at 10 amps and 12 vac
amps. Meas. 5½ x 9 x 17. Complete
tubes. Shpg. Wt., 64 lbs. Cat. No.
62 ..... $14.95

SUPER PRO POWER SUPPLY
either rack or cabinet mounting type—
llent condition. Shpg. Wt. 60 lbs. Cat.
C-6609 ..... $12.95

PHONO TURNTABLE & PICKUP
ery fine unit for Public Address Type
.
up: Audax magnetic type.
or data: General Industries Model No.
G 4.
: 46500
f: 78 & 33⅓
volts 60 cycle
may be operated from 22V with built-
ransformer.
g. Wt., 50 lbs., Cat. No. C-6605 .. $9.95

RADIO TARGET TRANSMITTER
. range 1.5 to 22 mcs. a two tube bat-
operating transmitter easily lends itself
onversion to any freq. up to 6 meters.
ains National vernier dial and gear
e and telescoping antenna. Size: 8½"
7¼" W x 9½" D. Shpg. Wt., 35 lbs.
No. C-6405 ..... $9.95

RBS RECEIVER
20 mc. 14 tube super het mfg. by
mberg Carlson. Low-pass filters cut off
e 3500 cy. which is ideal for voice and
Schematic included, less cables.
e including power supply..... $54.95
e less power supply $40.00

EIVERS—R58A/ARQ-8 30 to 100
cs. NEW $9.95

EIVERS—R-443/ARN-5D 332 to 335
freq. 28 Volt DC power needed. EX.
..... $9.95 C-7066

EIVERS—BC-348 200 to 500 KC 1.5
mc—in 6 bands $74.95 C-7067

BLOWER MOTOR DATA
120 V 60 CY. 1 PH. 0.45 Amp. 1/40
@ 3400 RPM Cont. Duty Mfg. by
ohm Div. of Haward Ind. Blower In-
: 2⅞" dia. Outlet: 2¼" x 2¼" with
Approx. 150 CFM. Price $14.95
12

DUAL BLOWER MOTOR DATA
110 V. 60 Cy. 1 PH. 0.25 Amps 1/100 H.P 1650 RPM Cont. Duty Mfg. Oster Type **EC-487** Model 7 Approx. 100 CFM Intake 2⅞" dia. Outlet 1¼" x 2¼" with cap. Price $19.95 C-7011

PIX TUBE TESTER & AGING UNIT
Test all CRT's for TV age up to 4 tubes at one time. New $4.95 C-7044

RACK
19" wide x 79½" panel space. 17" Deep behind panel. Shpg. Wt. 175 lbs. Cat. No. C-6665 ..... $35.00

19" BLANK RACK PANELS
8¾" high, blank, grey steel. Shpg. Wt., 6 lbs. Cat. No. S-6395 ..... 65¢ 3 for $1.50

BC-221 FREQUENCY METER
Freq. Range: 125 to 20,000KC. Osc. Fund. Range: 125 to 250KC and 200 to 4000KC. Accur: 0.01% or ± 500 cy. $69.95 C-6335

CODOME CODE PRACTICE UNIT
This unit comes complete with an instruction manual which also contains a little basic radio theory. This unit is ideal for the novice in that the automatically transmitted morse characters are reproduced at 6 wpm. A nine-position rotary switch selects coded groups which are repeated. The last position provides use of a built-in key for sending. An audible buzz as well as a flashing light are produced simultaneously. The unit operates from 110 v. a.c. and employs a rotating printed circuit board. Shpg. Wt., 7 lbs. Cat. No. C-6607 ..... $17.95

SPARE PARTS KIT
This repair kit was originally issued for servicing Wilcox Electric Co. Type CS390 Control Equipment which was designed for the remote control of 10 transmitters, 8 receivers, 2 modulators and 2 rectifiers. The kit includes books with photos and diagrams for a dual channel audio-amplifier, microphone pre-amp-limiter and a 1000 cycle sine wave generator. Contains enough parts to build 2 complete P/S
Contains over 100 brand new parts: C-6360 $9.95

ANTENNA COUPLER CU-52/URR
Accepts 1 antenna in—10 out for receiving. Filters are supplied for various freq. bands and antenna in-put inpedence. Both balanced and unbalanced are supplied. Coax fittings included. C-7064. ..... Price: $14.95

NEW WESTON METERS
0-2 amps RF model 1523 2½" round ... $9.95
0-5 k.v. (range 0-1 mil) 3" sq. $9.95
0-2 amps dc 3" sq. $8.95
0-150 vac 3" sq. $9.95

FIELD TELEPHONE SETS
Type EE8 Complete in carrying case. Shpg. Wt., 18 lbs. .....$7.95 2 for $15.00
EX-COND. C-6443, same as above, NEW $9.95

SEND FOR FREE CATALOG
TUBES — NEW
803 —$2.50 ea.
5763 — 1.00 ea.
12AU7— .60 ea. ..... 2/$1.00
6AH6 — .60 ea. ..... 2/$1.00

EXCITER
Comprised of the following RF sections: 6AG7 — Crystal Oscillator; 6AG7 — Crystal Amplifier; 6V6 — First tripler; 807 — Doubler; 829-B Second tripler. Frequency range of crystal circuit: 4.16 to 7.40 mc. Output frequency range: 75.24 to 133.20 mc. Very easy to modify to operate on the 2 meter band, or use as exciter for a higher band. Size: 21¾" L x 10" H x 5¼" W. Shpg. Wt., 25 lbs. Cat. No. S-6316 .. $12.95

TELETYPE CONVERSION KIT NO. 105382
For conversion of type 15 printer to provide automatic carriage return and line feed at end of line and to provide combined carriage return and line feed upon reception of carriage return selection Mfg. by Teletype Corp. Chicago. BRAND NEW including instructions. Shpg. Wt., 2 lbs. Cat. No. S-6326 ..... $19.95

SMALL INSTRUMENT CABINETS
These are a grey crackel cabinet measuring 16¼" W x 8" H x 8" D. with a top lid. They also contain a U.H.F. TV tuner with few other components. Excellent for instruments, small receivers, transmitters, etc. Shpg. Wt., 40 lbs. Cat. No. S-6403 .....$2.00

TK 207 PRESS WIRELESS TONE KEYER
Keys 1000 cys. can be easily converted for A.F.S.K. mounted on a standard 19" x 5¼" grey relay rack panel includes power supply and spare tubes. BRAND NEW—limited quantity. Shpg. Wt., 28 lbs. Cat. No. S-6327 ..... $19.95

AERIAL WIRE
Reel contains approximately 138 feet of phosphor bronze, no. 16 stranded, 200 lb. test antenna wire. Has galvanized clips on ends. Brand new. Shpg. Wt., 3 lbs. Cat. No. S-6313..... $1.50 4 for $5.00

DAQ ANTENNA
Consists of sensing ground plane antenna and a loop antenna. The sensing antenna ground plane elements are: radiator 5'6" long, 4 radials each 4' long, the loop max. and a loop antenna. The sensing antenna diameter is 6'2" and mounted under the ground plane. Shpg. Wt., 27 lbs. Cat. No. C-6324 ..... $6.95

ANTENNA
A-27 (Phantom)
A dummy load for tuning a transmitter up to 50 W output in the freq. range of 2 to 4.5 m.c. Shpg. Wt., 6 lbs. Cat. No. S-6409 Only $1.00

ART-13 TRANSMITTER
Clean & like new with all tubes. Power output is a very conservative 100 watts. Power required is 28 v DC @ 100 a, 400VDC @ 225 Ma & 1250 VDC 2 250 Ma. See power supply below.
Weight 70 lbs. Price with tubes..... $39.95
Power Supply for ART-13 includes both Hi & Lo voltage supplies for 115V-60 cycles. $49.95

COAXCABLE & CONNECTORS
Type N Connectors each end 22½" overall length length RG 9/U cable. Shpg. Wt., Cat. No. S-6636 ..... $1.50
Type N Coax Connectors, UG-21 D/U new in poly bags. Shpg. Wt., Cat. No. S-6546 $1.00 ea. ..... 6 for $5.00

ll prices are F.O.B. our warehouse Philadelphia, Pa.

l merchandise accurate as to description to the best of our owledge.

ur purchase money refunded if not satisfied.

Terms: Our terms are cash. All trade and cash discounts have already been deducted in our catalog quotations. All prices are net. F.O.B. Phila.

SELECTRONICS buys surplus inventories, close-outs, overstocks . . . anything electronic. Please put us on your bidders list.

SELECTRONICS *1206 S. Napa Street*
Philadelphia, Pa.
HO 8-7891 — HO 8-4645

For further information, check number 37, on page 110

FAMOUS B & W PRODUCTS
All New at 50 to 60% of Amateur Net Prices!

MODEL 370
Single Sideband Adapter

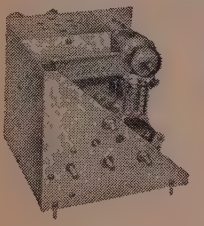
is a truly selective, bandpass type, adapter unit using the double conversion principle to bring the performance of yesterday's receivers up to the requirements of tomorrow. In addition to superlative performance on SSB, it permits true single-signal CW reception and, through B & W's exclusive "Gating Control," selective sideband reception on AM phone signals.

An integral 20 kc toroidal bandpass filter with 3kc passband assures sharp skirt selectivity with attenuation of unwanted signals a minimum of 50db. Self-contained in a handsome modern cabinet, the Adapter comes to you complete with power supply and 7" dynamic speaker. It is easily installed and adjusted to **any** receiver having an IF between 450 and 500 kc.
Our Price $59.95 wired $34.95 kit

MODEL 651
MATCHMASTER

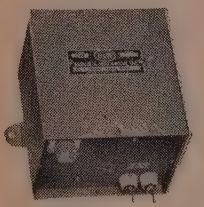
a versatile instrument which provides in one completely self-contained unit: **Dummy Load** to perform all kinds of transmitter tests without putting a signal on the air. Maximum SWR 1.2 to 1 from 500 kc to 30 mc. **Direct-Reading R-F watt meter** for precise adjustments of all R-F stages up to 125 watts — higher powers by sampling. Excellent repeat accuracy over entire 125 watt scale. **Integral SWR Bridge** for matching antennas and other loads to transmitter. Direct measurement of SWR enables precise adjustment of beam antennas, antenna tuning networks, and mobile whip antennas. Note: Not left in circuit during transmission.
Our Price $14.95

MULTI-BAND FREQUENCY MULTIPLIER



Model 504C exciter unit makes transmission on either the 80-40-20-15 or 10 meter bands available at the flip of a switch. An ideal driver for Class "C" or linear amplifiers, the frequency multiplier may also be used as a low power transmitter when equipped with appropriate accessories. Operation requires 6 to 10 volts driving power from an external crystal oscillator or VFO between frequency range of 3350 to 4000kc and a suitable power supply providing filament and DC plate power.
Our Price $29.95

1-KW BALUNS



will match an unbalanced power source to a balanced load. Provide maximum transfer of power, maximum signal-to-noise ratio, minimum SWR, and minimum line radiations. Designed to fit rotary-type antennas. No tuning required for installation except adjustment to the "T" match. **Single Band Beam Balun:** 75 ohms unbalanced to "T" bar section. Compact, weatherproof construction utilizing precision, high quality components. Dimensions: 3½" x 3½" x 4". Weight: two pounds.
10 Meter Band ..... Catalog No. 700
15 Meter Band ..... Catalog No. 701
20 Meter Band ..... Catalog No. 702
Our Price $1.49

PRECISION TOROIDAL TYPE SSB BANDPASS FILTER

Here is a reasonably priced, highly selective filter especially designed for SSB operation. The **Model 360** uses stabilized toroidal inductances and precision silver mica capacitors to provide bandpass and attenuation characteristics that remain constant under changing operating temperatures. Filter amplitude characteristic is virtually flat for the nominal 3.0kc passband with sharp skirt selectivity on **both** sides of the bandpass region.
Our Price $9.95

Special While They Last ....

PL259	**Pkg. 5**	**$1.75**
SO239	**Pkg. 5**	**$1.75**

F.O.B. Pensauken—Min. order $5.00

SURPLUS CORNER
4576 Route 130, Pensauken, New Jersey

For further information, check number 26, on page 110

Novice [*from page 61*]

Letters

Hector (Hec) Cole, G3OHK, 25 Causew Road, Seaton, Workington, Cumberland, En land writes this interesting letter that might ha an answer to your problem or you might sho it to some one else with a problem.

"Dear Walter: Although I am not a Novice always read your column. I was going to let n subscription to *CQ* lapse and try your riv American magazine. But now the final issue *CQ* has arrived and I am reluctant to let it g so I will be reading your stuff.

"I was interested in your comments regardi those who lack confidence to take the exams. wonder if my experiences would help?

"For many years I had been interested in rad but always avoided taking the theory because could never get anywhere with the Morse key.

"About three years ago—when I was 55 yea of age—I decided to really make the effort. Wi no one to help me I swatted away and sent in n application for the RAE. I was told to report the local college to sit the exam. And there was—an oldster sitting amongst a lot of youn sters. They were taking exams in other subjec all very unnerving. I came away with the fir conviction that I had made a hash of it.

"Anyway—nothing to do but bite my fing nails and wait and sweat. Two months went by- the slip arrived—I had passed. I felt great.

"But now came the real test—Morse. The on chap that could help me was an ex-ham and bloke who had been in the R.A.F., but it w inconvenient to enlist their aid. So, with ve little help I got started. The tape recorder was great help, I doubt if I'd have managed witho it. Finally, after lots of hard work, I applied the G.P.O. for a test. I had to go to Newcastle- about 90 miles—and I made it. And if I can do anybody can—but it takes the effort to be mad The harder it is to get through the bigger t thrill. Get a thing easy and you never apprecia it.

"Best of luck to all the lads there. Yours, Hec

By golly Hec, I'm sure glad that someone se things my way for once and you sure have prov that the initial effort is the important one obtaining the amateur license. A positive a proach to any task is the most important i gredient of success. Too many defeat their effo by giving in to the idea that they can't do t job. Actually you never know until you ha given it everything you have without holdi back. I have found out that even in failure the is success, at least you know it won't work th way, so try another. While experimenting wi the electric light bulb, Thomas A. Edison w heard to say, "Well, that's 1000 things that wo work", yet we now have electric lights all ov the world. He knew that he would never be su cessful unless to tried everything.

Help Wanted

The help wanted column this month has on

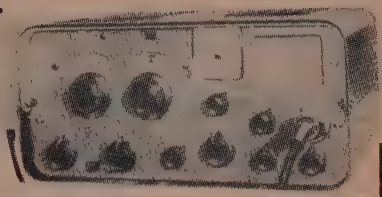
Polytronics and Terry W9DIA
will get you on 6 and 2
FAST AND EASY!

The powerful 62B VHF POLY-COMM

the transceiver that covers both 6 meters and 2 meters! al for the novice, technician or general class operator! Operates 110V AC or 12V DC.

ONLY $5 DOWN

UP TO 3 YEARS TO PAY



Ham Net $379.50
—only $13.52 monthly (3 years)

TAKE YOUR CHOICE OF ANY POLYTRONICS VHF GEAR ON HAMDOM'S EASIEST TERMS—$5 DOWN—3 YEARS TO PAY

ow little
ay after
own
ent —
VHF
quarters

eed
sh?

your ham
cash. Tell
you have—
offer.

	Price	1 Year	2 Years	3 Years
Poly-Comm 62 B and 62 CD combined 6 and 2 meter transceiver 110 VAC/12 VDC	$379.50	$34.32	$18.72	$13.52
Poly-Comm "6" and "6" CD, AC-DC—includes AC/DC power supply, DC cord, mounting bracket	319.50	28.82	15.72	11.35
Poly-Comm "2", same as above but for 2 meters	339.50	30.66	16.72	12.07

STAY ON THE AIR

Why go off the air? Deal with Terry and you use your trade in until your new equipment arrives at your shack!

INFORMATION FOR ORDERING

Only $5.00 down required for any New Equipment. 10% required for reconditioned equipment. Payments shown on new equipment are for 36 Month Plan. A $60 order for either new or used equipment, may be financed up to one year, two years on a $120 order, or three years on $180 order. If you do not already have one of our Credit Cards, to speed your order you should supply us with the credit information when you send in your down payment. See page 000, January CQ. Persons purchasing on our time payment plan must be of 21 years of age and regularly employed. Servicemen with APO addresses with good credit ratings accepted.

AMATEUR ELECTRONIC SUPPLY

THREE STORES TO SERVE YOU

lease send mail orders to Milwaukee Store
West Lisbon Ave., Milwaukee 8, Wis. • PHONE WEST 3-3262

IICAGO 31, ILL.
50 Milwaukee Ave.,
'HONE RO 3-1030

ORLANDO, FLORIDA
23 Azalea Park Shopping Center, Phone 277-8231

Send all mail orders and inquiries to
AMATEUR ELECTRONIC SUPPLY
3832 W. Lisbon Ave., Milwaukee 8, Wisc.

Ship me .....
I enclose .....; I will pay the balance in
☐ 1 year ☐ 2 years ☐ 3 years
If new account — enclose credit information — see page 000, January CQ for details.
I want to buy .....and want to trade .....What's your deal?
Name .....
Address .....
City .....Zone.....State .....
☐ Send reconditioned equipment bulletin.

For further information, check number 48, on page 110

Statement of Ownership

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 AND JUNE 11, 1960 (74 STAT. 208) SHOWING THE OWNERSHIP, MANAGEMENT AND CIRCULATION of *CQ*—The Radio Amateur's Journal, published monthly at New York, N.Y. for October 1, 1962.

1. The names and addresses of the publisher, editor and business manager are: Publisher: Sanford R. Cowan, 6 Embassy Court, Great Neck, N.Y.; Editor: Arnold Trossman, 300 West 43rd Street, New York 36, N.Y.; Managing Editor: none; Business Manager, Richard A. Cowan, 6 Embassy Court, Great Neck, N.Y.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address as well as that of each individual member must be given.) Sanford R. Cowan, 6 Embassy Court, Great Neck, New York.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or either securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and beliefs as the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required by the act of June 11, 1960 to be included in all statements regardless of frequency of issue.) 79,887.

Signed RICHARD A. COWAN, Business Mgr.

Sworn to and subscribed before me, this 1st day of October 1962.

MORRIS LANGHOLTZ, Notary Public
(Commission expires March 30, 1963)

BE PROFESSIONAL — USE LITTLE JIGGERS

Accurately drill and tap the ends of rods. No more worries about mis-alignment. Expert job!

LITTLE JIGGERS slip over the ends of rods (5 sizes, from ¼" to ½") and can be used with hand or electric drill—drill-press, or lathe. Tapping Jiggers included. EASY TO USE—HARDENED STEEL—LONG LIFE!

SAVE MONEY—TIME—HEADACHES—Make Pillars & Shafts

Set of 10 LITTLE JIGGERS (#401A) $5.95
Postpaid in U.S.A.

No C.O.D. orders please. *Other sets available for Hex Rods.*

Write: **ETHICAL ENTERPRISES INC.**, (Dept. C2)
988 U.S. Highway 202,
Somerville, New Jersey

BACK ISSUES FOR SALE $1.00 per copy

1950—Jan., July, Oct.
1951—All issues, except Nov.
1952—All issues, except June, Aug.
1953—All issues, except May, July, Dec.
1954—All issues, except Feb.
1955—All issues, except Nov.
1956—All issues, except April
1957—All issues, except Jan., Feb., May, and Nov.
1958—All issues, except Jan., June, July, Sept., Oct.
1959—All issues, except Jan. and June
1960—All issues, except May
1961—All issues
1962—All issues, except Jan.
1963—Jan.

BC-603 Conversion article (Sept. & Oct., 1958 CQ)

Reprints available at 50¢ per set.

CQ Magazine
300 West 43rd St., New York 36, N. Y.

one item, I guess you folks don't need any or were too busy to write. If you would lik have help on your problems just drop the i mation to Walter G. Burdine, W8ZCV, R. Waynesville, Ohio. If you need help requ an answer please send a stamped self-addre envelope along. I have the answer to most o letters that I am behind on at the present and you will receive an answer to your l very soon. I have just received some diagram the equipment that you asked about.

Mike Byrd, P.O. Box 275, Mango, Flo can use help; he says he would rather be a than anything in the world.

Keep the mail coming, keep the transm busy and listen before transmitting. Make best of this year. Good operating and 73

VHF [*from page 67*]

Speaking of information wanted, William gese, 65 Walnut St., Bridgeton, New Je would like to learn more about parametric plifiers and pump oscillators, although he glects to mention which band.

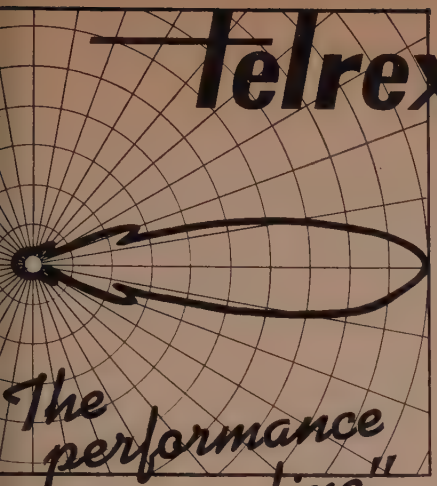
Dropping down the coast a bit, Jeff Kra WA2GFP, wonders about conducting a pol v.h.f. operators to see who the top five or would be. He continues, "I wonder if somet along this line might be run by the v.h.f. col of *CQ* and the results eventually publishe should stir up some interest. I would be ha to do the actual tabulation and have the sent here." What say fellows, are you interes

From over Ohio way, we learn that Baker, W8AJY of Novelty, Ohio made 104 tacts within 6 evenings after receiving her ti 100 stations were in Michigan but after chec them over, she found she actually had only

Slipping back over to the Atlantic, we up in the Carolinas which everyone know *Ragchewer* territory. Several good 6 meter o ings occurred there during the early par November. On the evening of the 9th, the 6 m band sounded like 75 on a weekend! K4SN on each night at 0300Z on 50.07 c.w. with b headed north. He calls for one minute and lis for four until 0330Z. Bryan, W4OAB and land, W4URS are now operating sideban Charlotte. URS runs a 10B into a home-b mixer and plans to go the 4-250 linear route s Bryan cranks out with an SB-10 modified straight through operation on 6 with a ho brew mixer and 829B for 2 meters. Both stat are looking for ground wave skeds with Ky., W.Va., and Tenn. Drop them a line in Char if you are interested. Don, W4BUZ also c ates 6 sideband into, of all things, a halo ant up above 65 feet.

If you are looking for that last db on 2 m and above, you probably need a Western tric 416B. Jack Shipman, W5DAV, P.O. 1443, Hobbs, New Mexico writes to say he quite a quantity of them at very reasonable

That runs us out of room for another 30. you then. 73, de Don, W6



"BEAMED-POWER" ANTENNAS and ANTENNA SYSTEMS

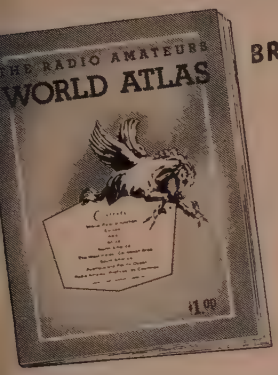
The Choice of the Discriminating Communication Engineer . . . the Man who Never Settles for Anything Less than THE-VERY-BEST!

You too — can enjoy World renowned Telrex performance and value!
Send for PL77 condensed data and pricing catalog, describes 107 popular amateur antennas from $6.95 to $999.00. Expanded data sheets — Your favorite band, also available.

—with a MATERIAL DIFFERENCE!"

ANTENNAS SINCE 1921 Telrex LABORATORIES
Communication and TV Antennas
ASBURY PARK 25, NEW JERSEY, U.S.A.

For further information, check number 42, on page 110



BRAND NEW! THE RADIO AMATEURS WORLD ATLAS!

Now, for the first time a world atlas compiled especially for radio amateurs. Contains all 6 continents of the world plus the polar projection and West Indies-Caribbean area. Country prefixes and zone boundaries on every map plus complete index. Ideal set of maps for field trips or ham shack. 16 pages, 8¾" x 12", 4 colors on quality paper. From your favorite dealer or order direct.

$1.00 postpaid

RADIO AMATEUR CALL BOOK, INC.
4844 Fullerton Ave. Dept. C Chicago 39, Ill.

SUBSCRIPTION ORDER

CQ Magazine 300 West 43rd Street, New York 36, N. Y.

☐ New
☐ Renewal

Subscription Rates: 36 issues—$13.00; 24 issues $9.00; 12 issues $5.00*
*The above rates apply to U.S. Possessions, APO, FPO, Canada & Mexico.

Sirs: Here is my remittance for $..... Enter my subscription order to "CQ" for the next ..... issues.

Name..... Call.....

Address .....

City..... Zone..... State.....

Pan-America and all other foreign: 1 yr. $6; 2 yrs. $11; 3 yrs. $16.

Ham Shop

Rates for the Ham Shop are 5¢ per word for advertising which in our opinion, is non-commercial in nature. A charge of 25¢ per word is made to all commercial advertisers or organizations. Since we do not bill for Ham Shop advertising, full remittance **must** accompany all orders.

Closing date is the 15th of the 2nd month preceding date of publication. Your copy should be typewritten, double spaced on one side of the page only.

Because the advertisers and equipment contained in Ham Shop have not been investigated, the publishers of CQ cannot vouch for the merchandise listed therein. We reserve the right to reject advertising which we feel is not of an amateur radio nature.

QSL's? WPE's? CB's? SWL's? Samples 20¢ (refunded). Sackers, W8DED, Holland, Michigan.

QSL's . . . Eyepoppers—Priced Right—Dime. Filmcrafters . . . Martins Ferry, Ohio.

QSL's, SWL's CB and WPE. Samples 10¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Arizona.

QSL-Cards low prices—Free samples, Debbeler Printing, 1309-C North 38th St., Milwaukee, Wis.

CBL's Different Gold Embossed Kromekite. Samples 10¢. Andy's, 12 Bridge, Amsterdam, N. Y.

QSL cards: 2 color, glossy; 100 for 2.50. Samples, Dime. Ramsbottom Printing, Box 237F, Kirksville, Missouri.

QSLs Samples, dime. Print Shop, Corwith, Iowa.

QSLs eyecatching designs . . . Dime. Filmcrafters . . . Martins Ferry, Ohio.

QSLs CBL's—Finest quality—extra fast service on stock or custom designed multicolor cards. Samples and catalogue 25¢ (refundable). Dunnahoo, 516A Prospect, Fairview, Mass.

RUSPRINT QSLs—SWLs 100 2-color glossy $3 postpaid. QSO file cards $1 per 100. Rusprint Box 7507 Kansas City 16, Mo.

QSLs SWLs XYL-OMs (Sample assortment approximately 9¾¢) Covering designing, planning, printing, arranging, mailing, eyecatching comic, sedate, fantabulous. DX-attracting. Protopay, snazzy, unparagoned cards. (Wow!) Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

HUNDRED QSLs 80¢. Samples, dime. Meininger, Jessup, Iowa.

QSLs SWLs that are different, colored, embossed card stock and "Kromekote." Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

QSL Kromekote 3-color . . . order 200 get 25 each of 8 different styles . . . many styles. Samples 10¢. Progress Printing. Box 1154, Biloxi, Miss.

QSLs four colors glossy stock, forty designs—send $5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Constantine Press, Blandensburg, Md.

GLOSSY 3-color QSL cards 100—$4.50. Free sampler. Rutgers Vari-Typing Service 7 Fairfield Rd., Somerset, N. J.

QSLs—SWLs samples 10¢. Malgo Press. Box 375 M.O., Toledo 1, Ohio.

QSLs—Samples 15¢ Rubber Stamps: name, call address—$1.35 Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSL Cards Brownie, W3CJI—3110 Lehigh, Allentown, Pa., Catalog with samples 25¢.

500—2 color QSL cards $3.95—Giant Log Book—1000 log forms $6.98 c.o.d. Hollywood Printing 14231 2 N. Mariposa, Hollywood 27, Calif.

QSL Cards in 3 colors $2.50 per 100. Free samples and catalogue. Garth Printing, Box 51Q, Jutland, New Jersey.

COMMUNICATION Teletype unusual surplus bargains. Free flyer. MDC-923 W. Schiller, Phila. 40, Pa.

ONE THIN dime brings 50 page eye-popping war surplus electronics catalog. Fabulous bargains. Meshna, Lynn, Mass.

TUBES Wanted All types. Highest prices paid. Write: Lou-tronics, Inc., 131 Lawrence Street, Brooklyn 1, N.Y. Stamp for ham tube list.

WANTED Teletype printers, perforators, reperforators, transmitter-distributors test equipment: Model 14, 15, 19, 26, 28, etc. All types Collins receivers, 51J, R-388, R-390, 75A, etc. Cash or trade for new amateur equipment. Write Tom, W1AFN, Alltronics-Howard Co., Box 19, Boston 1, Mass. Richmond 2-0048.

ELECTRONIC Tie clip—Lucite embedded 3.9 meg 1/10 watt resistor mounted on high quality clip. Very smart appearance. Ideal gift. Send $20.00 to RK Specialties, P.O. Box 1682, Orlavista Branch, Orlando, Fla. Money Back Guarantee.

TOROIDS Uncased 88 mh like new. Dollar each. Five $4.00 p.p. DePaul, 309 South Ashton, Millbrae, Calif.

INDUSTRIAL Tubes type 5555 $95.00 ea. Frequency shif verters AN-7 URA-6 frequency shift converters $295.00 swap for other gear. Spera Electronics, 37-10 33 St., L.I.C

TV CAMERA Low cost—easily built—complete schemati structions 50¢. Denson Electronics, Rockville, Conn.

FOR SALE: Complete instructions including 28 page bookl 22" x 36" schematic for converting the ART-13 transmit a.m. and s.s.b. Satisfaction guaranteed. $2.50. Sam Ap 501 N. Maxwell St., Tulia, Texas

---

TELEVISION Camera Kit—easy to build step by step instru suitable for HAM TV, educational, industrial. Medical Craftsmen Instrument Labs., Inc., 60-30 34th Ave., Woo L.I., N.Y.

DETROIT Distributor offers better cash deals from Colli down. Volume purchases at old prices permits sale HT-3 75S-3 $620; SX-101A $369; Clegg 99 $139; Zeus $595. Wr list! Radio Supply & Eng. Co., Inc., W8VSK, Detroit 1, M

WANTED Army Sets or Parts. GRC, PRC, FRR/URR, TCC, S —Send Listings. Quick Cash. Anker Electronics, 1617 So St., Box 26, Wilkes Barre, Pa.

100KC RF Oscillator unit, with crystal and oven, ac .00015%, used in SRT-14 Transmitter, Schematic inc 250vdc 6.3ac, New in original boxes $20.00 less tubes, with tubes, Post Paid, Check with order . . . RITCO, Bo Annandale, Va.

TEST Equipment: Ballantine ac vtvm and null detector 100 volts $125; Simpson Model 260 vom $20; Simpson 303 vtvm $30; RCA Model WV-98B vtvm $45; Hycon Mod digital vtvm $100; Leeds and Northrup weatstone bridge 5300 $40.00; Heathkit Voltage Calibrator $15; Heathkit tronic Switch $15; Dumont 208 Scope $35; TS-34 Scope Amateur Equipment: Mark II 30 watt 40 and 80 meter ceiver w/2 power supplies $30; Hallicrafters S-27 uhf re 26-148 mc am-fm $50; BC-222 10 meter transceiver $15 10 and 6 meter transceivers $15; RC-182 IFF set, 500 valuable parts $75. Herb Belin, 1078 Mountain Avenue, Be Heights, N.J.

FREE Bargain Bulletin, Write: "Meininger Ads." Jessup,

BUILD: Any construction article appearing in handbooks QST or 73. High quality parts and workmanship. Satisf Guaranteed. Write for a bid: Servotronic Instruments W5JFJ and K5OOR, Box 12441, Houston 17, Texas.

A-1 RECONDITIONED equipment. On approval. Trades, Hallicrafters S-107, $69.00; S-85, $79.00; SX-99, $99.00; S $179.00; SX-111, $149.00; SX-101A, $229.00; Hamm HQ-100, $119.00; HQ-110, $169.00; HQ-170, $259.00; 75S-1, 75A-4, 32S-1, National, Gonset, Elmac, Heath, Jo RME, many others. Write us for lists. Henry Radio Co Butler, Missouri.

COLLINS Owners Work a.m.! S-line KWM-1-2! No drillin soldering! No chassis removal! Instant switching! Easy in tion! Wired kit $5.00. Kit Kraft, Harlan, Ky.

ATTENTION Everybody Buy! Sell! Swap equipment th "Equipment Exchange Bulletin"! Many interesting offers, S copy free! Write: Brand, Sycamore, Ill.

ALUMINUM for every ham need. Write to Dick's 62 Avenue, Tiffin, Ohio, for list of tubing, angle, channel, ca plain and perforated sheet and complete beam kits.

FOR SALE Radio-Craft 1938 (50 Years of Radio) A Chronol History of Radio 1600 to 1921. 1909 Operator's Wireless graph & Telephone Handbook by Victor H. Laughter. O 1930, Dec-1930—Jan. 1931, April, May, June, July, August, 1931 excellent condition Short-Wave Craft. Central Elect 10-B $80.00 never used. 1933 Super-Wasp with power needs very little work with magnetic speaker and coils f 40, and 20 Meters. 1927 third edition Radio Amateurs book, 1918 issue Wireless course in twenty lessons by Secor, S. Gernsback and A. Lescarboura, all these best Some 1930 and 1931 QST, 1932 to 1939 QST and Radio fifty per copy plus postage, 1933 to 1937. Shortwave-Craft $1. copy plus postage. No personal checks accepted. W7RQF, East 8425 South, Sandy, Utah.

CANADIANS Trade unused transistors, miniature tanta miniature transformers, trimpots, etc., for Canadian Coins to 1936. Write for trade list. Leonard D'Airo, K2CDS. 383 burgh, Ave., Massapequa Park, New York.

SELL Health DX-60 $70, HG-10 vfo $35, K1ROI, 68 Mall Dorchester, Mass.

COLLINS 75A-4, 2 mech. filters, speaker. Mint conds. o owner. Ser. #4825 sent PP $575.00. Max Freedman, 1342 N. 48 St., Phoenix 8, Ariz.

NC-98 Receiver. Globe DSB-100 Sideband Transmitter. $60 Both in good condition. Bill Onesky, Box 635-H2, Laf Indiana.

MODEL 26 Teletype with automatic carriage return and lin Buyer must pick up. W2JQ, 68 Everett Place, Plainfield, N

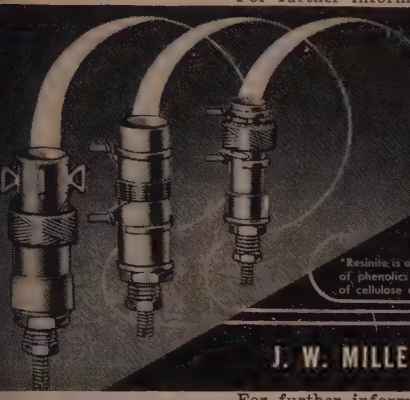
SELLING complete operating station: Super Pro receiver B General coverage to 40MC with added 3 kc filter and p detector, excellent for SSB: also Bendix 150 watt trans with antenna relay. ALL JUST $200. Rosenfeld, 186 Avenue, Floral Park, N.Y.

HOW COMPACT CAN YOU GET? (as compact as Collins has made the 30L-1).

This tightly engineered, new 1000-watt linear amplifier is the same size as the famous Collins KWM-2. It has a self-contained power supply, too. Its price: $520. Its appearance: "solid quality". Order the Collins 30L-1 now, for early delivery.

C & G ELECTRONICS
Northwestern headquarters for Collins
2502 Jefferson Avenue, Tacoma 2, Wash.
2221 3rd Avenue, Seattle 1, Wash.

For further information, check number 43, on page 110



*RESINITE ADJUSTABLE R. F. COILS

— 20AOOORBI (form only): ¼" dia. x 13/16" long. Coils wound on this form have an inductance range of .079 uh to 1.25 mh.

— 21AOOORBI (form only): ⅜" dia. x 1⅛" long. Coils wound on this form have an inductance range of 0.68 uh to 12.5 mh.

— 22AOOORBI (form only): ½" dia. x 1⅞" long. Coils wound on this form have an inductance range of 5.70 uh to 175.0 mh.

*Resinite is a phenolic impregnated tubing which combines the mechanical and dielectric advantages of phenolics with the high dielectric strength, moisture resistance, and non-corrosive properties of cellulose acetate. Resinite can be certified to MIL-P-79B Type PBG.

MILLER QUALITY PRODUCTS

J. W. MILLER COMPANY 5917 South Main St., Los Angeles 3, Calif.
(AVAILABLE THROUGH YOUR LOCAL DISTRIBUTOR)

For further information, check number 44, on page 110

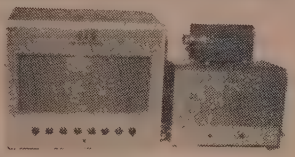
FANTASTIC VALUE IN CLOSED CIRCUIT TELEVISION

BRAND NEW—COMPLETE SYSTEM SHOWN

LOW - LOW $495.00

Complete system with all tubes—wired and tested. Less Vidicon and Lens—with Schematics (connecting cables and plugs only—supplied, but not assembled)

Approximately 1/10 Mfg. Sug. Resale Price



ONLY $649.50

Complete system with test vidicon, lens, and assembled cables, schematics, wired and tested.

POWER SUPPLY
11 Tubes & Transistor—31.5 Kc Crystal Controlled Oscillator

CONTROL MONITOR
12 Tubes & 21DAP4

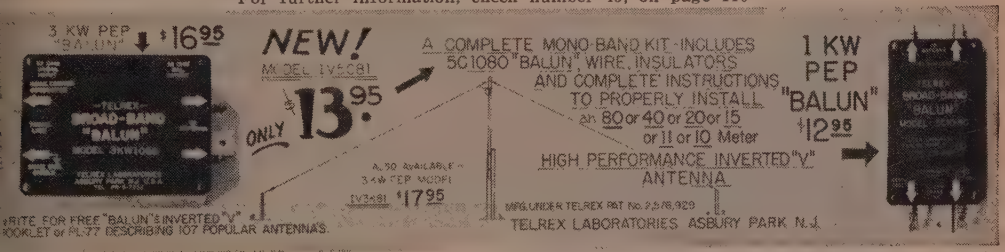
CAMERA
4 Tubes & VID

IA Standards of 525 lines, 60 Fields, 30 Frames and 2:1 interlace—Aspect Ratio 7:3—Capable of 700 li. Horizontal resolution and 350 li. Vertical

Write for Catalog #1273—"HOW TO BUILD A LOW COST TV CAMERA," Industrial and Broadcast Cameras and equipment, Miscellaneous accessories, lenses, tripods, etc. **ONLY 50¢**

DENSON ELECTRONICS CORP., Box 85, Rockville, Conn. Telephone TRemont 5-5198

For further information, check number 45, on page 110



TE CO TAPETONE ELECTRONICS LABORATORIES INC.
99 Elm St., West Newton 65, Mass.

UFACTURERS OF ULTRA LOW NOISE PREAMPLIFIERS, CONVERTERS, AND PARAMETRIC AMPLIFIERS·····

EPHONE: (617) 332-1123 TWX: (617) 332-0016

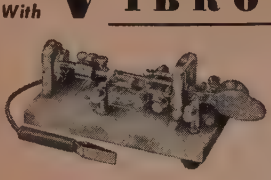
RT: MICROWAVE INTERNATIONAL CORP
36 W. 44TH ST., NEW YORK 36, N.Y.
TELEPHONE: YU-6-2738 CABLE: MICROKEN, N.Y.

TELETYPEWRITER EQUIPMENT • COLLINS

51J-3 and R-390A RECEIVERS Teletype: #14, 15, 19, 26, 28; Kleinschmidt: TT4A, TT76, TT98, etc. Telewriter Receiving Converter, etc. For general information & equipment list, write to TOM, W1AFN *ALLTRONICS-HOWARD CO.*, Box 19, Boston 1, Mass. RIchmond 2-0048.

MAKES SENDING A PLEASURE

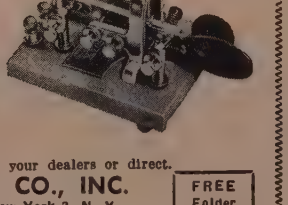
With **VIBROPLEX**



No special skill required. Just press the lever — Vibroplex DOES THE REST. All parts precision machined and key is adjustable to any speed. Will not tire the arm. Five models priced at $17.95 to $33.95.

VIBRO-KEYER

In building electronic transmitting units, Vibro-Keyer supplies the perfect part. With a finely polished base 3½" by 4½" and a weight of 2¾ lbs. Has same contacts and finely finished Vibroplex parts. Standard, at $17.95. DeLuxe, with Chrome Plated Base, priced at $22.45.



Order today at your dealers or direct.

THE VIBROPLEX CO., INC.

833 Broadway New York 3, N. Y.

FREE Folder

EASY TO LEARN CODE

It is easy and pleasant to learn or increase speed the modern way—with an **Instructograph Code Teacher.** Excellent for the beginner or advanced student. A quick, practical and dependable method. Available tapes from beginner's alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready, no QRM, beats having someone send to you.

ENDORSED BY THOUSANDS!

The Instructograph Code Teacher literally takes the place of an operator-instructor and enables anyone to learn and master code without further assistance. Thousands of successful operators have "acquired the code" with the **Instructograph System.** Write today for full particulars and convenient rental plans.

INSTRUCTOGRAPH COMPANY

4711 SHERIDAN RD., CHICAGO 40, ILL.
4700 Crenshaw Blvd., Los Angeles 43, Calif.

J. J. GLASS
THIS MONTH'S SPECIALS

CRYSTALS

Low Freq. for Sideband & Experimental Applications: 370-540 kc within ½ kc or less. Use on fundamental or harmonic. Originally used on 54th or 72nd harmonic .....49¢ each, 5 for $2.25

Sealed Overtone Crystals in small Metal Holder

½" Spacing: 11, 12, 13, 16, 17, 18, 19, 20, 23, 25, 26, 27, 28, 31, 35, 36, 37, 38, 42, 43, 44, 45, 46, 47, 48, 49, 50 MC, fractions omitted. We will ship to the closest fraction requested. 59¢ each, 3 for $1.49

Special Purpose Crystals

500 kc FT-241 holder	75¢
200 kc FT-241 holder	1.49
200 kc sealed metal holder	1.95
100 kc in large bakelite holder	**2.49**

Crystals for Test or Marker Purposes

1,000 kc in sealed metal holder ½" spacing	1.95
5,000 kc in FT-243 holder	1.95
9,000 kc in sealed metal holder ½" spacing	1.95
10,000 kc in sealed metal holder ½" spacing	1.95
13,000 kc in sealed metal holder ½" spacing	1.95

Very, Very Low Frequency Crystal in sealed holder. With fraction. For experimental purposes. 4 kc 1.95

WANTED! GRC, PRC & TS Equipment. Will swap or buy for cash.

J. J. GLASS CO.

1624 S. Main St., Los Angeles 15, Calif.
RI 9-1179 (213)

Fridays 'til 9 Send for Catalog!

ATTENTION Mobileers Heavy duty Leece-Neville 6 volt 100 system $50; 12 volt amp system $50; 12 volt 60 amp system 12 volt 100 amp system $100. Built in silicon rectifier a nators 12 volt 60 amps $100; 12 volt 100 amps $125. Guaran no ex-police car units. Herbert A. Zimmerman, Jr., K2PAT, Coney Island Avenue, Brooklyn 30, N.Y. Tel: DEwey 6-7388

CONVERT any television to sensitive, big-screen oscillosc Only minor changes required. Plan $1.95. Relco Industries, 10563, Houston 18, Texas.

MULTIPLEX Adapter—Circuit board set of 5 coils, sockets complete instructions $15.00. D. L. Stoner, Box 7388Q, Loma, California.

SELL Plate transformer, thermador CS5664, 4000vct at also tapped for 1000v supply; 350W modulator, 6SN7's, 80 813's complete with tubes, all filament transformers, thermador modulation transformer. Best offer all or AF-67 $50.00. W4OAB, 4117 Murrayhill, Charlotte, N.C.

PREMIUM quality Reconditioned Equipments! Terms! Tr Trades! World's largest stock! Collins 32V -2 $249.95; 720 $59.95; Globe Chief 90 $44.95; Gonset Commander $4 Johnson Thunderbolt (80-10M) $399.50; Collins 75S-1 $34 Hallicrafters SX-73R $449.00; SX-88 $299.50; SX-100 $17 S-120 $49.95; Hammarlund HQ-105TR (Transceiver) $15 HQ-110 $169.00; National NC-190 $169.00; TMC-GPR-90 ($399.00. Leo, WØGFR, Box 919, Council Bluffs, Iowa.

HAM-BUERGERS Used Equipment, Money Back Guarantee. 51-SB $165.00; Globe Linear $79.95; Chief Deluxe $59.95; set Comm.II-2 meter $225.00, Gonset 6 meter Linear $9 G-28 10 meter $144.95. Comm.I & vfo 2 meters $149.95; H crafters SR-34 $274.95, FPM-200 $1375.00; Heath Ap $249.95, Mohawk $249.95, DX-40 $54.95; Johnson KW Matc with swr bridge $119.95; Valiant FW/T $349.95, Pacem $324.95; National NC-183 D $239.95; NC-300 $244.95; NC $364.95. Trades. Write for Free List. New Collins equipmen stock—Write for information & prices. HAM BUERGERS, Wync Pa. CA 4-1740.

DON'T miss a single issue of the Ham Trader, magazine dev to buying and selling Ham equipment. Don't pay for ad un item is sold. For sample and information write The Trader, Box 174, Dept. C, Franklin Square, N.Y.

YOUR HEATHKIT Conelrad Alarm gathering dust? Convert a useful versatile Photoelectric Control Unit. Kit with inst tions, $4.95. A. Melechinsky W1YAE/2, 16 Norwood Ave., Rock, N.J.

WANTED: Military and commercial laboratory test equipm Electronicraft, Box 399, Mt. Kisco, N.Y.

EIMAC Tube Sockets and Chimneys in stock for all EIMAC tu Also new factory guaranteed EIMAC tubes including the 3-400Z for $34.00. Send for list, Bill Slep Company, Dra 178 CQ, Ellenton, Florida.

IN STOCK new 1963 Marsan TV Camera, 110v/60 cycle, F1.9 48 mm coated lense, output rf Channel 2-6 mc 0.1 video 1/5v. p.p. Automatic light level compensation circuit, 4⅝" x 6⅛" x 10", weight 14 lbs. One of the best closed ci TV cameras on the market for the low price of $575.00. Hig trades given on Ham or surplus gear. Bill Slep Company, Dra 178 CQ, Ellenton, Florida.

MILITARY receivers, R-105/ARR-15 $59.50; R-45/ARR-7 $5 RDQ 35-1000 mc $145.00; AN/URR-13 200-400 mc $27 R-19/TRC-1 $45.00; BC-314 $45.00; BC-224 $75.00; BC-639, p/s $95.00; BC-669, with p/s $175.00; BC-946 new Broad Command receivers $32.00; Collins R-388/URR $495.00; Co R-390/URR Digital Readout Receiver $750.00. All receivers in mint condition. Bill Slep Company, Drawer 178 CQ, Ellen Florida, Phone 722-1843.

TOROID RTTY Kit: Mark-Space Discriminator and Bandpass fil Includes 4-88 mh and 1-44 mh uncased, like new toroids; formation sheet, mounting hardware and six mylar capaci $5.00 Postpaid. Toroids: Specify 88 or 44, less capaci $1.00 ea., 5/$4.00 Postpaid. KCM Products, Box 88, Milwa 13, Wis.

A-1 reconditioned equipment. On approval. Trades. Terms. H crafters S-107, $69.00; S-85, $79.00; SX-99, $99.00; SX- $179.00; SX-111, $159.00; SX-101A, $249.00; Hammarlund 100, $119.00; HQ-110, $169.00; HQ-170, $259.00; Collins 75 75A-4, 32S-1, National, Gonset, Elmac, Heath, Johnson, R many others. Write us for lists. Henry Radio Company, Bu Missouri.

I HAVE a recently completed and factory checked Pawnee H transceiver for 2 meters. Am interested in selling outrigh trading for 6 meter transceiver. Contact John Phares, K5 445 Jay Street, Beaumont, Texas.

SELL Collins 75A-4, #2163, with speaker $465.00, Hallicraf HT-32A, Serial #230705, $425.00, with manuals and in condition. Both for $850.00 or best offer. No trades. W4ZUK, 2817 North Atlantic Blvd., Ft. Lauderdale, Fla.

6 METER transceiver like new $80.00, used Silver rece new Temco 75GA transmitter, RME VHF 152, RTL 2 meter ba transceivers. Make cash offer. Box 631 San Bernardino, Cal

WANTED: Hallicrafters S-20 receiver (early S-20R), plus early models. State condition and best price. H. Hoagland, South Robertson Blvd., Los Angeles 34, California.

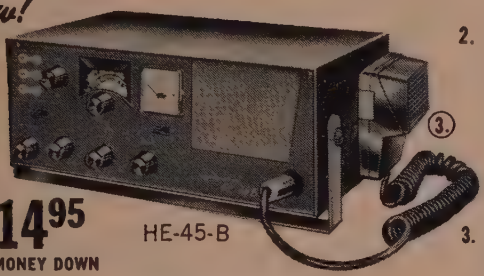
79.50 NO MONEY DOWN

KT-390 ①

99.95 NO MONEY DOWN

HE-30 ②

New!



114.95 NO MONEY DOWN

HE-45-B ③

KT-200
Kit Form
64.50

HE-10
ed and Tested
79.95
MONEY DOWN

KT-200 HE-10 ④

LAFAYETTE RADIO

QUALITY AMATEUR GEAR SINCE 1923

INVITATION: Stop in at any of our locations and visit our fully stocked **HAM SHACKS — FREE DEMONSTRATIONS** without obligation. Lafayette carries a complete line of famous brand amateur equipment and accessories.

STARFLITE T.M. 90 WATT PHONE and CW TRANSMITTER KIT

1. **● 90 Watts Phone or CW on 80 Thru 10 Meters ● Built-in 3-Section Low-Pass Filter ● Clear, Chirpless, Grid Block Keying**

Dollar for dollar you can't beat this new Lafayette Starflite transmitter. Easy to build and operate, it glistens with quality and performance all-over.

THE LAFAYETTE HE-30 Professional Quality Communications Receiver

2. **● Tunes 550 KCS to 30 MCS in Four Bands ● Built-in Q-Multiplier for Crowded Phone Operation ● Calibrated Electrical Bandspread on Amateur Bands 80 Thru 10 Meters ● Stable Oscillator and BFO for Clear CW and SSB Reception ● Built-in Edgewise S-Meter**

Sensitivity is 1.0 microvolt for 10 db. Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER.

LAFAYETTE HE-45-B DELUXE 6-METER TRANSCEIVER

3. **● High Efficiency—Up To 100% Modulation ● New Modulation and Power Transformers plus 7868 Power Pentode ● New Heavy-Duty Communications Vibrator ● Front Panel Antenna Loading Controls ● New Standby Switch; VFO Power Jack ● Sensitive Superheterodyne Receiver ● Built-in 117 VAC and 12 VDC Power Supplies ● Rugged Push-to-Talk Ceramic Microphone**

LAFAYETTE HE-50A 10-METER TRANSCEIVER

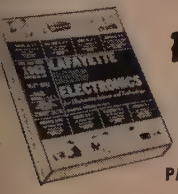
Similar to above except for 10-meter operation **114.95**

QUALITY TOP VALUE COMMUNICATIONS RECEIVER

4. **● Superhet Circuit Utilizing 8 Tubes and Rectifier Tube ● Built-in "S" Meter With Adjustment Control ● Full Coverage 80-10 Meters ● Covers 455KC to 31 MC ● Variable BFO and RF Gain Controls ● Switchable AVC and Automatic Noise Limiter**

The Communications Receiver that meets every amateur need — available in easy-to-assemble kit form. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10 kc, image reflection is —40 db at 3 MC.

AFAYETTE RADIO
ELECTRONICS



FREE!

CUT OUT PASTE ON CARD

SYOSSET	JAMAICA	NEW YORK	BRONX	NEWARK
PARAMUS	PLAINFIELD	SCARSDALE	NATICK	BOSTON

LAFAYETTE RADIO DEPT. CB-3
P.O. BOX 10, SYOSSET, N.Y.

Send me the FREE 388 Page 1963 Catalog 630

Name .....

Address .....

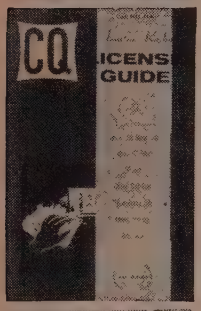
City ..... Zone ..... State .....

For further information, check number 13, on page 110

THE CQ HAM MART

MOBILE HANDBOOK

Anyone who tries to go mobile without getting this book, should think twice before going ahead. *Bill Orr, W6ASI* has put everything you need to know in this book, Build-its by the dozen . . . solutions to ignition problems, keeping the battery charged, noise . . . only *$2.95* postpaid.



CQ LICENSE GUIDE

212 pages of everything the Amateur must have to get his license and progress toward the general class ticket. Plus many additional pages of vital information for the ham operator. All this for only *$2.50.*

CQ ANTHOLOGY

Most amateurs do not have a good file of back issues of *CQ*. So we've looked back through the years *1945-52* and assembled all in one place the articles that have made a lasting stir. The issues containing most of these articles have long ago been sold out. The price is a mere *$2.00*

THE NEW RTTY HANDBOOK

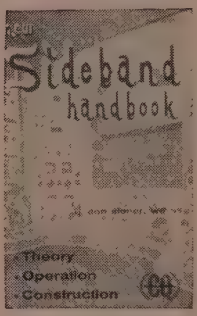
A treasury of vital and "hard to get" information. Loaded with equipment schematics, adjustment procedures, operating procedures, etc. A valuable asset to both the beginning and the experienced RTTY'er. Special section on getting started, all written by *Byron Kretzman, W2JTP*, a well known authority in the field. This book is a must for your library! Only *$3.95.*

VHF FOR THE RADIO AMATEUR

You can't afford to be without this dynamic new handbook designed with the VHF amateur in mind Filled from cover to cover with all new and original construction material presented so that you can understand it. Written by *Frank C. Jones W6AJF*, nationally acclaimed for his VHF pioneering. Available now for only *$3.50.*

COMMAND SETS

This is a collection of r containing all of the availa formation on the conversion popular "Command" transmitt receivers into good ham trans and receivers. Invaluable for Technician, General, Advanc Extra class operators 136 f pages, only *$1.50* postpaid.



SIDEBAND HANDBO

Written by *Don Stoner, W* was almost one full year in th aration of this terrific volum is not a technical book. It e sideband showing you how along with it . . . how to kee rig working right . how t when it isn't . . . and lots to build-it stuff, gadgets, re adaptors, exciters, amplifiers. only *$3.00.*

COWAN PUBLISHING CORP. CQ-
Book Division
300 West 43rd Street
New York 36, N. Y.

LIGHTED GLOBE	$24.95
UNLIGHTED GLOBE	19.95
ATLAS	15.00
COMMAND SETS	1.50
CODE RECORD	3.50
REGULAR LOG SHEETS (100)	1.00
SSB LOG SHEETS (100)	1.00
HAM'S INTERPRETER	1.50
TVI HANDBOOK	1.75
BINDER—YEAR WANTED	4.00
VHF FOR THE RADIO AMATEUR	3.50
CQ ANTHOLOGY I	2.00
CQ ANTHOLOGY II	3.00
HI-FI BOOK	2.50
SIDEBAND HANDBOOK	3.00
CQ LICENSE GUIDE	2.50
SURPLUS SCHEMATICS HANDBOOK	2.50
DX ZONE MAP	3.00
NEW RTTY HANDBOOK	3.95
DIODE SOURCE BOOK	2.50
USA-CA RECORD BOOK	1.25
"NEW" MOBILE HANDBOOK	2.95

SIRS: My check (money order) for $_____ is enclosed. Please send the following items t

Name_____

Address_____

City_____ Zone____ State_____

New York City Residents Add 3% Sales Tax

ED 3D24 Tubes. W2ASY, 64 West Allendale A..e., Allendale, Jersey.

ED National 183-D. Give condition, serial, price first letter. eibold, 731 Talma St., Aurora, Illinois.

E four new 6146's, K1IIK.

INS 75A-4 Serial 1370 with three filters excellent condi- $475 f.o.b. W9KFA, PO 627, Cedar Rapids, Iowa.

ED Motorola FMTR80D or 140D mobile unit. Ralph Villers, One Steubenville, Ohio.

KWM-1 installed mobile complete with mike, two Mosley nd antennas, in original-owner Super 88 Olds, 1957 4 door, power, electric windows, air conditioned hardtop, nearly rubber, plus a.c. power supply, equipped for motel opera- Original total cost $6300. Has nearly biggest barefoot l on bands. Car and rig, best offer over $1500. Jonathan, K, Phone 516—FR 8-1155.

LETT 310 vom pocket-sized, without leads, new, unused, un- ched, immaculate, $30. Other offers considered, Douglas t, Jr., 310 Holly St., Columbia, S.C.

ING Knight R-100, Xtal Calibrator, S meter, Speaker. Like $75.00. Emil Renken, Smithfield, Nebr.

SALE: Model 14 Reprf. with keyboard rapid feed out, end- e, cover, reel, 60 wpm, Sync Motor. $85. K5AON, 867 nshire, Dallas 18, Texas.

INS KWM-2, s.n. 11681, 516F-2 ac supply with built-in ker. Used 10 months, never mobile. Excellent condition. .00. Al Rothschadl, W9WAQ, 1223 Ninth Street, Watertown,

QUE Radios:—3 Atwater Kents models 30, 40 and 60. Also art Warner Model 801. Sell-Trade. Stan., W8QKU, 2748 e, Detroit 12, Michigan.

ANT factory wired and Heath SB-10 275 watts pep with the wing built-in improvements: Full break-in cw, extra 11 posi- crystal switch, teletype shifter and more. Both only $350. sell separately. W2GQN, 114 Phylis Court, Elmont, N.Y., -3555.

E 30 Western Electric 416 B tubes 2 4-400 Eimac. Need 4X 150A and sockets, Hi voltage power supply, or any 50- or 220 mc gear, or what have you. W9BPG, 609 Henrietta Gillespie, Illinois.

SALE or Trade: All like new condition; Collins KWM-1 $475, crafter SX-101 Mark 3 $210, Drake 2-B $210, Techtronix D Scope $175, Heath Seneca $135. Want 200V, 75S-3, , 51J-3, KWS-1, KWM-2, W2EXH, A. Fenster, 90 Hausch , Roosevelt, L.I., N.Y.

TED—160 meter coils for 200V; Selling SX-101—$200; Telrex IM Beam $180; Ranter—$150; Collins 310B1 $100; Heath Q plier—$10; WA2UTU, 511 Laurelton Blvd., Long Beach, N.Y.

2 with PM-2 Collins lightweight power supply 110/220 vac. latest model with new Collins spinner knob. Purchased two hs ago and used less than 5 hours. Perfect. Shipped insured id in U.S. $1,000.00 in original cartons with manuals. fied check or money order. James C. Stevens, Engineering , RCA Duncan Canal, Petersburg, Alaska.

TRADE:—6 meter phone transmitter, 15 watts input, in- s microphone, power supply, crystal, complete $45. Need: 21, BC-348, Condenser Analyzer, tube checker, polaroid ra, or? ? Stan, 2748 Meade, Detroit 12, Mich.

L 14 Teletype tape printer excellent like new condition, removed from commercial service complete with beautiful gony table; $100.00. J. H. St. John, W4MXA, 2720 Park t, Jacksonville, Florida.

ED: commercial, military, All types, ARC, ARN, ARM, BC, PRC, TRC, URR, URM, TX, 618S, 17L, 51R, 51J, others . . .), Box 156, Annandale, Va.

Are tune ups torture?

re you tired of weak, ineffective signals? Tune your rig by most effective method available. Tune up with a Delphi Field nsity Meter model 112.

Ultra Sensitive

Compact

es no Power

Monitors % Modulation

only

$9.95

P.P.D. Anywhere in U.S.

KC thru 500MC. .02 volts R.M.S. average sensitivity. plete with antenna and choice of rubber feet or magnetic p for mobile use.

Dealer Inquiries Invited

DELPHI ELECTRONIC INSTRUMENT CORP.

South Grand Ave. Baldwin, L.I., N.Y.

REAL LOW PRICES!!!

WALKIE-TALKIES AND OTHER EXCELLENT EQUIPMENT

MODEL "MAB" is a Navy Walkie-Talkie which provides single-channel, crystal-controlled reception and transmission (AM) between 2.0 and 4.5 MC. Receiver uses miniature tubes in a **superheterodyne circuit** for maximum sensitivity and selectivity. Transmitter employs miniature tubes in a crystal-controlled oscillator (1T4), a 3B4 RF Power Amplifier which will deliver from 200 to 250 milliwatts RF power to the antenna (can be souped up), and a 3B4 Heising (plate) Modulator stage. 7 tubes total in trans-receiver. Unit is housed in a water-tight bakelite case. 7½"H. x 10"W. x 3-9/16"D. RANGE 1 MILE OR BETTER, depending on location and conditions. Requires 135 volts "B" and 1½ volts "A" batteries. Excellent for 75 meter Ham. CD. Fire Dep't, emergency marine, or conversion to other uses. Supplied Complete with all tubes, r'c'ving & x'mitting crystals (sorry, we cannot accept orders for a specified frequency. Crysals are FT-243 type, and can be easily changed), telescopic antenna with adjustable loading coil, headphones, microphone, and canvas carrying case with straps. In Almost-New condition, but not-tested at this price. Shpg. wt. per set 15 lbs. **EACH** ..... as described, only $12.95
PER PAIR ..... 2 Complete Sets, as above $24.50

MODEL DAV is a Navy Walkie-Talkie, same as above, but with Direction Finding Loop within so that receiver section may be used for D.F. or Homing on the crystal-controlled receiving frequency. Same transmitter as outlined above for Walkie-Talkie use with supplied adjustable telescopic antenna. Encased in watertight, sturdy plywood case, slightly larger than above. Shpg. wt. Complete with accessories as for MAB. 20 lbs.
EACH, AS NEW—but not tested at this low price $16.95
INSTRUCTION BOOK FOR MAB OR DAV only with purchase of units ..... $ 1.00

MINIATURE VIBRATOR PACK FOR MAB OR DAV, eliminates nuisance and expense of dry batteries. Operates from miniature 6 volt storage battery, not supplied, available from many surplus dealers. With Instruction Book. Shpg. wt. 5 lb.
UNUSED. **EACH** $7.95

TCS TRANSMITTER. Famous work-horse of the Navy, rugged, efficient reliable. Delivers 20 watts phone, 40 watts CW in 1500KC to 12.0 MC range. Incorporates VFO or 4-crystal controlled channels. Excellent for mobile or fixed station use. Complete with tubes, Used-Very Clean condition. Shpg. wt. 60 lbs. All Accessories extra.
EACH, not tested at this low price $39.95

TCS RECEIVER, companion to above, 1.5 to 12.0 MC in 3-bands. Continuous tuning or 4 fixed crystal controlled frequencies selection. Employs a stage of RF amplification and 2 stages of IF to provide good sensitivity and selectivity. Requires separate Power Supply. Excellent for Hams, CD, MARS, etc. Shpg. wt. 50 lbs. USED—EXCELLENT Condition.
PRICE EACH, not tested at this low price, with tubes $49.95

TCS 12 VOLT DC POWER SUPPLY, to operate above units from 12 V. DC. Contains 2 Dynamotors, one for transmitter and one for receiver supply, complete filtering, starting relay, etc. NEW UNITS. Shpg. wt. 40 lbs. **PRICE EACH** $17.95

TCS REMOTE CONTROL UNIT with built-in loudspeaker, volume control, microphone and phone jacks. Shpg. wt. 10 lbs.
NEW UNITS, EACH $9.95
As Above, but "Used—Very Good" $6.95
Plug Connector for Remote Control $1.50

TCS CONNECTOR CABLE. Transmitter or Receiver to Power Supply. Shielded. (Specify which). 3 foot length $5.95; 11 foot length wt. 5 lbs. $9.95.

TCS ANTENNA LOADING COIL, permits use of short whip type antennas on lower frequencies. Shpg. wt. 8 lbs. "Used—Good."
EACH $6.95

BC-611 WALKIE TALKIE CHASSIS. Brand New and Boxed, with Antenna, but less tubes, coils and crystals. **EACH** $8.95

12 V DC i, 12 HP DC MOTOR. Make boat electric winch, electric car or tractor for kiddies. Rated 1/12 HP at 1725 rpm. but with built-on reducing gear assembly actually develops more power at final speed of 43 rpm. 7" heavy brass worm gear available separately for 2½ rpm. NEW material.
MOTOR ..... **EACH** $12.95
WORM GEAR, 7" for 2½ rpm. $2.75

TG-34 CODE PRACTICE SETS, learn to copy code with the best device made. Less than 5 to 25 words per minute at your finger tip. Like New condition. Shpg. wt. 55 lbs.
EACH $29.95

RA-20 POWER SUPPLY. To convert BC-312 Receiver to 110 V AC operation.
USED—GOOD $14.95 each **NEW UNITS $17.95 each**

CAR OR TRUCK WINDOW DEFROSTER. Designed for use on gov't. trucks, jeeps, etc. Excellent for passenger cars, commercial vehicles, in stormy weather. Easily removed and stored away when not needed. Operates from electric 6V. DC (use two defrosters—in series—for 12V. DC systems, one can be installed on rear window) and each set is complete with switches, fuse holder, and necessary wire. Defroster has 4 resistance wires running inside glass (8" x 16") to produce heat for defrosting window. Defroster is held to window by 4 suction cups. NEW, UNUSED condition, each packed in metal case. Shpg. wt. 7 lbs.
EACH $6.95

All Above Material Subject to Prior Sale. 25% Minimum Deposit with All C.O.D.'s. Min. Order—$5.00. All Prices F.O.B. Our Address.

WE BUY PRC, GRC, R-390 OR 391, SP-600, ETC. WE WILL PAY TOP DOLLARS FOR GOOD CONDITION EQPT.

— TELEMARINE —

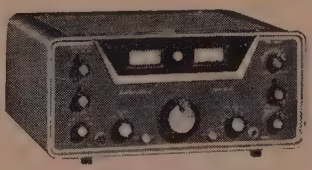
COMMUNICATIONS
142 West B'WAY, NEW YORK 13, N. Y.
PHONE: COrtland 7-5444

For further information, check number 24, on page 110

You can't beat our SPEEDY PERSONAL SERVICE

Bob Henry WØARA
Butler, Mo.
ORchard 9-3127

Let me quote you on this
BRAND NEW
hallicrafters SR-150



SR-150 TRANSCEIVER

Eight-band capability–full coverage provided for 80, 40, 20, 15 me
one segment of 10M. **Front panel controls:** Tuning; Band Selector; Fina
R.F. Level; Mic. Gain; Pre-Selector; R.I.T.; Rec. RF Gain; AF Gain;
(Off/Standby, MOX/VOX); Function (CW, USB LSB); Cal. **General:** Dial c
100 kc crystal cal.; VFO tunes 500 kc; 18 tubes plus volt. reg., 10 di
varicap. Rugged, lightweight aluminum construction (only 17½ lb.); siz
15" x 13". **Transmitter Section:** Power input–150W P.E.P. SSB; 125W C
and unwanted SSB suppression 50 db. **Receiver Section:** Sensitivity
1 uv for 20 db. signal-to-noise ratio. Audio output 2W; overall gain, 1 u
output. 6.0-6.5 1st I.F. (tunes with VFO). 1650 kc 2nd I.F.

Ham Net $650

P-150 AC Power Supp. .....
P-150 DC Power Supp. .....
MR-150 Mobile Mount .....

We can supply all Hallicrafter equipment. Write us for prices, information and special trades...

Walt Henry, WA6RN
Anaheim, Calif.
PRospect 2-9200

A-1 RECONDITIONED EQUIPMENT

Nearly all makes and models. Big savings! 15 day trial—90 day warranty. 90 day full trade back on new apparatus. Write for Bulletin.

Ted Henry W6UOU
Los Angeles
GRanite 7-6701

WORLD'S BEST TERMS

- Only 6% a year finance cost
- 20 months or longer to pay
- Only 10% down (or your trade-in as down payment)
- No finance charges if paid within 90 days
- Reduced charges if paid off ahead of time
- You get more flexibility of financing in the future (such as re-financing) because we finance our terms.

Other Hallicraf equipment . . .

HT-32B SSB Transmitte
HT-33B Linear Amplifie
HT-37 SSB Transmitter
HT-40 AM-CW Transmi
HT-40K Kit form of abo
HT-41 Linear Amplifier
SX-100 General Coverag Receiver
SX-101A Ham Band Receiver
SX-110 General Coverag Receiver
SX-111 Ham Band Recei
SX-115 Ham Band Recei
SX-117 Ham Band Recei
SX 140 Ham Band Recei (80-6)
SX-140K Kit form of abo

Write, phone or visi store today! Inquiries & orders military men and outside USA wan

Butler 1, Missouri
ORchard 9-3127

Henry Radio Stores

11240 West Olympic Blvd.
Los Angeles 64 Ph. GRanite 7-6701

BIG

TRADE-IN

Contest Calendar [*from page 90*]

Editors Note

Conditions for the c.w. portion of our WW DX Contest were about the same as for the phone week-end, pretty rough for the northeastern part of the country. However, the boys to the south seemed to be doing OK, especially on 20 and the anticipated opening on 40 did not come up to expectations.

We predict that average scores will be 30 to 40% below last year's levels. Of course there are always exceptions, some guys come up with scores that you swear can't be done. A thorough re-check usually proves you wrong. Considering the present sun-spot cycle, we didn't do too badly.

PY1AAB reminded us that if you worked any of the boys in Niteroi during the contest, you can apply for the "Conteste Cidade de Niteroi" award. Send your application to PY1AAB, P.O. Box 274, Niteroi—RJ, Brazil.

We haven't received enough logs to make up a worth while claimed scores list. Maybe next month. 73 for now, Frank, W1WY

St. Pierre [*from page 44*]

Newfoundland we did not make this trip and therefore cannot say.

ROUTE 3—If you desire to go via Newfoundland by a 700 mile railroad trip, you can leave your car in Sydney and take the above mentioned car ferry to Port-au-Basques. This boat connects with the Canadian National Railroad leaving Port-au-Basques at 9 AM. At about 7 AM the following day you will reach a small town called Goobies. Get off at this stop and take a taxi, which is unscheduled, 150 miles down the Burin Peninsula to a town called Fortune. Then take the M.V. *Spencer* to St. Pierre as described above. ■

YL [*from page 68*]

California YL Get-together

The annual All-Calif. YL Get-together will be held April 5-6, 1963 at lovely Miramar Hotel in Santa Monica with the Los Angeles YLRC as hostess Club. Sat. luncheon for the YLs; evening dinner to include OMs. K6BUS, Midge, is coordinating chairman; WA6AOE, Maxine, and W6JCA, Betty, will be hostesses.

Here and There

WA2WHE, Gretna, writes: "Three of us XYLs call ourselves the 'Red Wagon Widows,' as our OMs are *very* active in the Fire Depts. at our various QTHs. We wonder if there are other XYLs who feel they qualify and would like to join with us to form a group offering a certificate. Interested XYLs contact me at Box 512, Elizabethtown, N.Y."

Congrats to W6QGX, Harryette, on earning her private pilot's license. (K6BX take note.) . . . The L.A. YLRC is sorry to report member Mary LeBard, WA6EZK, became a Silent Key in October.

33, W5RZJ

NEW LOW PRICE!!

CENTRAL ELECTRONICS MM2 R. F. ANALYZER

$99.50

Originally $149.50

ONLY $5 DOWN

2 Years to Pay ($5.74 a month)

LIMITED QUANTITY · ORDER NOW

MM2 ADAPTERS
RM 50 for 50 kc... $12.50
RM 80 for 80 kc ... 12.50
RM 455 for 455—500 kc IF . 12.50

We bought the entire factory stock and Terry says, "Clear 'em out at $99.50!" Analyzes every transmitter RF and AF function . . . also analyzes IF patterns of incoming signals. No tuning. Just plug it in and it's ready to use. Complete with tubes, scope and instruction book. No more at this price. Only $5 down!

Amateur Electronic Supply
3832 Lisbon Ave.
Milwaukee 8, Wisconsin

Enclosed $..... Ship me.....
I will pay balance in ☐ 1 year ☐ 2 years

Name.....
Address.....
City.....Zone ..... State.....
☐ Send latest Reconditioned Equipment Bulletin

For further information, check number 23, on page 110

FREE Catalog
OF THE WORLD'S FINEST ELECTRONIC GOV'T SURPLUS BARGAINS

HUNDREDS OF TOP QUALITY ITEMS — Receivers, Transmitters, Microphones, Inverters, Power Supplies, Meters, Phones, Antennas, Indicators, Filters, Transformers, Amplifiers, Headsets, Converters, Control Boxes, Dynamotors, Test Equipment, Motors, Blowers, Cable, Keyers, Chokes, Handsets, Switches, etc., etc. Send for FREE CATALOG—Dept. CQ.

FAIR RADIO SALES
2133 ELIDA RD. · Box 1105 · LIMA, OHIO

FM MOBILE EQUIPMENT

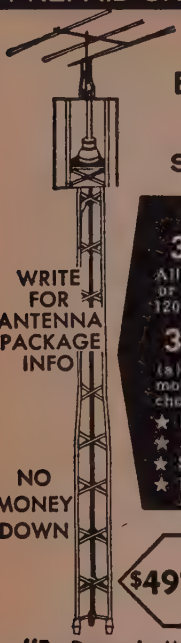
MOTOROLA FMTRU-41V
6V—150MC $39.50
12V—150MC $44.50
STRIP TRANSMITTER $10.00

Sales to Amateurs Only

MOTOROLA T44A-6
6-12V—450MC
$49.50

FM SURPLUS COMPANY
1100 TREMONT STREET
ROXBURY 20, MASS.

PREPAID OR FREIGHT ALLOWED*



SAVE
BUY FROM WRL
WRL SPIRE SPAULDING TOWERS

WRITE FOR ANTENNA PACKAGE INFO

NO MONEY DOWN

SELF-SUPPORTING
3 SIZES 32', 40', 48'

All self-supporting with large tribander or other beams. May be extended to 120 ft. with proper guying.

3 MOUNTING BASES

(a) Rigid concrete mount. (b) Concrete mount with hinge base. (c) Earth anchor with hinge base (no concrete).

- ★ Fully galvanized
- ★ Aircraft riveted
- ★ Streamlined appearance
- ★ Includes rotor mount for Ham-M, AR22, etc.

$49.95 32 FOOT RIGID CONCRETE MOUNT

*East of Miss. River all shipments are via truck, collect, with $5.00 frt. allowance. West of Miss. River your choice: via rail frt. fully prepaid or via truck, collect, with 5.00 frt. allowed.

"By Demand – Most Popular Tower in the USA"

WRL World Radio Laboratories, Inc.
3415 W. BROADWAY PHONE 328 1851
COUNCIL BLUFFS, IOWA

For further information, check number 46, on page 110

READER SERVICE

CQ Magazine, Dept. RS

300 WEST 43rd STREET
New York 36, N. Y.

Coupon 2
Void after
Feb. 28, 1963

Please send me more information on your ads in the Feb. 1963 *CQ* keyed as follows:

1	2	3	4	5	6	7	8	9	10	A
11	12	13	14	15	16	17	18	19	20	B
21	22	23	24	25	26	27	28	29	30	C
31	32	33	34	35	36	37	38	39	40	D
41	42	43	44	45	46	47	48	49	50	D
51	52	53	54	55	56	57	58	59	60	E

Total Inquiries ☐

NAME_____
(Please Print)

Type of work (specify)_____

ADDRESS_____

CITY_____

ZONE_____STATE_____

advertisers index

Allied Radio Corporation
Alltronics-Howard Company
Amateur Electronics Supply 91, 95, 99,
Amatronics Inc.
Amperex Electronics Corporation 22,
Amplidyne Labs

Barker & Williamson, Incorporated
Barry Electronics
Bendix Corp.
Lew Bonn Company
Burstein-Applebee Company

C & G Electronics Company
Cleveland Institute of Electronics
Collins Radio Company Cover
Communications Equipment Company
Communication Products Company, Inc.

Delphi Electronics Instruments Corp.
Denson Electronics Corp.
Dow-Key Company, Incorporated 25,

Editors & Engineers Limited
Ethical Enterprises

Fair Radio Sales
Finney Company, The
F. M. Surplus Company

Glass, J. J. Company
Gotham
Greenlee Tool Company

Hallicrafters Company 2,
Hammarlund Manufacturing Company
Harvey Radio Company, Incorporated
Heath Company 26,
Henry Radio Stores
Hy-Gain Antenna Products

International Crystal Manufacturing Co.
Instructograph Company

Jeff-tronics Unlimited
Johnson, E. F. Company

Lafayette Radio
Lampkin Laboratories, Incorporated

Millen, James Mfg. Co. Inc.
Miller, J. W. Co.
Mosley Electronics, Inc.
National Radio Company, Incorporated Cover

New-Tronics Div. of Automatic Radio Inc.

P & H Electronics
Pennwood Numechron Co.
Petersen Radio Co. Inc.

RCA Tube Div. Cover
Radio Amateur Call Book, Inc.

Selectronics
Shure Brothers Inc.
Surplus Corner

Tapetone Electronic Laboratories, Inc.
Telemarine Communications Co. Inc.
Telrex, Laboratories 101,
Texas Crystals
Tri-Ex Tower Corp.
Tristao Towers, Inc.
Turner Microphone Co.

U.S. Crystals, Inc.

V & H Radio
Vibroplex Co. Inc.

Western Radio Co.
World Radio Labs Inc. 6, 88,

AVAILABLE NOW
FOR SCHEDULED DELIVERY

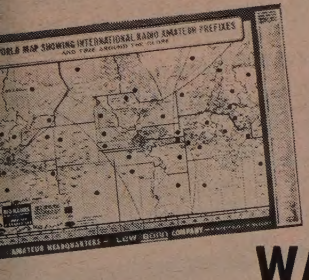
COLLINS NEW 62S-1

VHF CONVERTER *for 6 and 2 meters*

The 62S-1 will more than double your frequency coverage. The 625-1 may be used to cover 49.6 to 54.2 mc plus 143.6; 148.2 mc. Provides transmit and receive functions in 14.0 - 14.2 mc range with the 32S, 75S KWM series. No cable changing when moving from HF to VHF.

10% down **$89.50** ($895.00)

Order Today for Scheduled Delivery from Hamateur Headquarters



FREE!
LARGE, 38"x25"
WORLD WALL MAP

Showing radio prefixes and time around the globe. Send 50c, in coin for this easy to use colored map. Enjoy the thrills and fun of contacting licensed stations all over the World. Fifty cents will be refunded with your next order. Use coupon on right to order your Model HT-41 Hallicrafter and World Map from Hamateur Headquarters.

THE Lew Bonn CO.

Distributors of Nationally Known Amateur Equipment

Dept. CQ-2 **67 South 12th St., Minneapolis 3, Minn.**

Call, write or use coupon

Attn: Joe Hotch Federal 9-6351

☐ I am enclosing 50¢ in coin, please send me large wall map. I understand 50¢ will be refunded with my first order.

☐ Place my order for scheduled delivery. Enclosed find $_____

☐ Send complete specifications on 62S-1.

Name_____ Call letters_____

Address_____

City_____ Zone____ State_____

For further information, check number 21, on page 110

Big ALLIED Winter Sale
OF RECONDITIONED EQUIPMENT!

All units are expertly reconditioned and covered by the same 90-day warranty as new gear. Some items are one-of-a-kind and subject to prior sale. If you don't see what you want, just ask—chances are we have it. Remember, you can own used equipment on our Credit Fund Plan for no money down and up to 24 months to pay. Please address orders and inquiries to Ron DeMarco W9NNR, Technical Service Dept.

Barker & Williamson	
5100 Transmitter	$199.00
Clegg	
99'er Six-Meter Transceiver	109.00
Collins	
KWS-1 Transmitter	950.00
KWS-1 (RF Unit Only)	675.00
75S-1 Receiver	425.00
32S-1 Transmitter	495.00
32V-2 Transmitter	225.00
Drake	
1-A Receiver	189.00
2-B Receiver	239.00
Eico	
720 Transmitter	79.00
730 Modulator	49.00
Globe	
Chief Deluxe Transmitter	59.00
Champ 350 Transmitter	279.00
Champ 300 Transmitter	219.00
Champ 300A Transmitter	259.00
King 500C Transmitter	395.00
Gonset	
Six-Meter Linear Amplifier	79.00
GR-212 Receiver	89.00
3275 Six-Meter Converter	39.00
Hallicrafters	
SX-140 Receiver	99.00
S-53A Receiver	49.00
SX-99 Receiver	114.00
S-120 Receiver	54.95
SX-28 Receiver	79.00
SX-62 Receiver	159.00
SX-62A Receiver	199.00
HT-32 SSB Exciter	399.00
HT-33 Linear Amplifier	299.00
S-34 Transceiver	210.00
S-107 Receiver	74.50
SX-110 Receiver	129.00
SX-140 Receiver	99.00
Hammarlund	
HC-10 Converter	89.00
HQ-100 Receiver	139.00
HQ-129X Receiver	129.00
HQ-170 Receiver	259.00
Harvey-Wells	
T-90 Transmitter	89.00
Heath	
DX-20 Transmitter	25.00
DX-100 Transmitter	145.00
MT-1 Cheyenne Mobile Transmitter	89.00
Seneca Six and Two-Meter Transmitter	169.00
Johnson Viking	
"6N2" Transmitter	89.00
Ranger II Transmitter	289.00
Challenger Transmitter	89.00
Valiant I Transmitter	299.00
Knight	
R-55 Receiver	49.00
R-100 Receiver	79.00
C-11 Citizens Band Transceiver	19.00
C-27 Citizens Band Transceiver	49.95
T-60 Transmitter	49.00
T-50 Transmitter	
"Span Master" Receiver	
Lincoln	
L-2000A Citizens Band Transceiver	
Multi-Elmac	
AF-67 Transmitter	
PMR-6 Receiver	
PMR-7 Receiver	
PMR-8 Receiver	
National	
NC-190 Receiver	
NC-66 Receiver	
HRO-60 Receiver	
RME	
HF-10/20 Converter (For 10, 15 and 20 meters)	

"HOT BUY" SPECIALS & CLOSEOUTS
BRAND-NEW IN FACTORY CARTONS

Lincoln 6-Meter Transceiver. Special sale—we're overstocked! Includes mike, 50.2-mc xtal, AC supply. Brand new! 11 lbs.
90SU678DR. Reg. $57.50. **$7.55 Off!..NOW ONLY $49.95**

Gonset GSB-201 Linear. Huge $140 savings! Works 80-10 with 1500-w. PEP input to 4—811A's. 92 lbs. **13 left.**
90SZ016DR. Reg. $419.95. **Save $140! NOW ONLY $269.95**

Collins 75S-1 SSB Receiver. Famous precision-made receiver with 12 xtals. New—factory carton. 21 lbs. **While 7 last!**
90SU109DR. Reg. $520.00. **Save $71! NOW ONLY $449.00**

VHF Mobile Whip. New 59" fiberglas whip has spring, ball, body mt., 15' coax, plug. Easily cuts to 6 meters. 1 lb.
90SX024DR. Worth 3 times this!.....**A STEAL AT $4.95**

Gonset G-28 10 Meter Communicator. Save $140 on this excellent 50-w. transmitter/receiver. **While only 10 last!**
83SU587. Reg. $299.50.....**NOW ONLY $159.50**

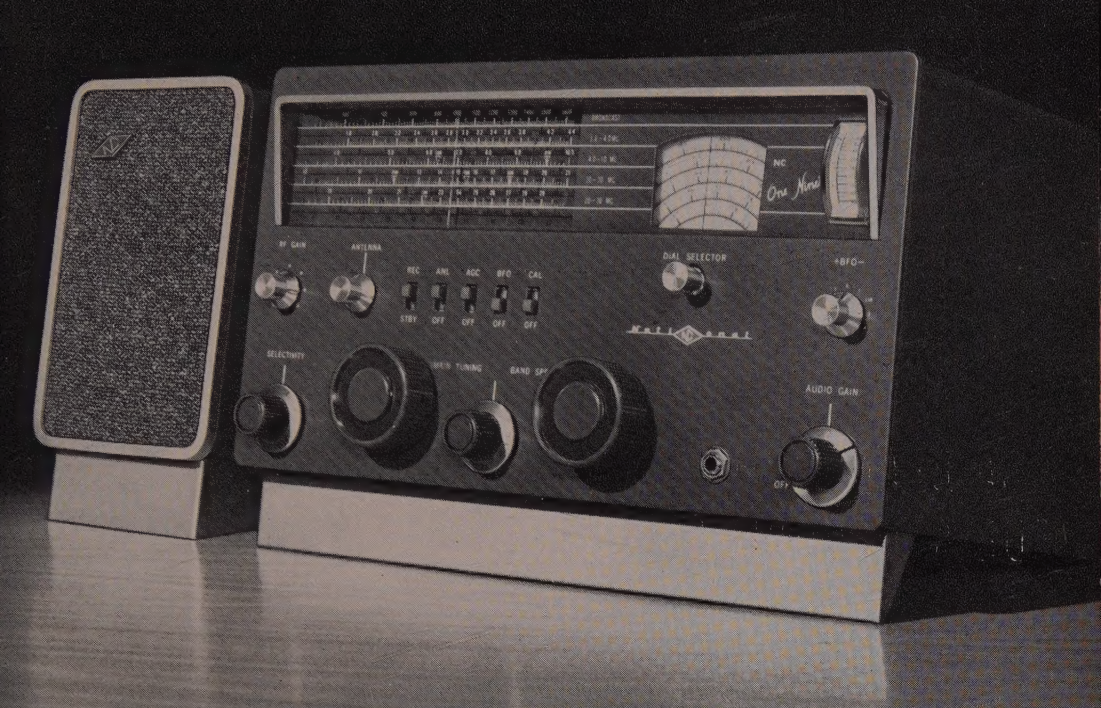
Select Your New Gear from our complete 1963 464-page value-packed catalog. If you haven't a copy, write for it today.

For reconditioned or new equipment, write to Ron DeMarco, W9NNR, or stop in and meet John Chass, K9LOK; Joe Gizzi, W9HLA; Tasker Day, W9QBB; Lou Green, K9WLB. In Milwaukee: Lowell Warshawsky, W9NGV; Burt Fischel, W9VOB.

ALLIED RADIO

100 N. Western Ave. Chicago 80, Ill

For further information, check number 40, on page 110



't Buy Any General Coverage Receiver Until You

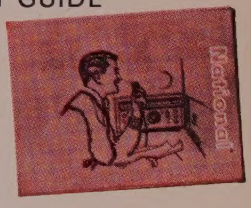
' NATIONAL'S PERFORMANCE-PACKED NC-190

NATIONAL ONE YEAR GUARANTEE

ational could have packed so many remarkable s into a receiver selling for only $219.95. You *can* nore, but first consider: the NC-190 gives you top M and CW amateur band performance as well as coverage from 540 KC to 30 MC in five bands with *conversion* above 4 MC. National's exclusive Dial r provides an extra found in no other competitive — accurately calibrated foreign broadcast *as* amateur bandspread! Three-step variable IF ity with the exclusive Ferrite Filter and sensitivity nan 1.0 uv for 10 db S/N, back up such operating s as a separate product detector, SSB/CW AGC S-meter operative on all modes. S-L-O-W 60:1 ead tuning, coaxial antenna input, voltage d oscillators, SSB/CW as well as AM noise and *five* main tuning bands all combine to bring re performance for the money than you ever possible. Whatever your need — main station , tunable IF for VHF or second receiver, try the first.

WRITE FOR FREE COPY OF NEW NATIONAL EQUIPMENT GUIDE

- Complete technical details and features of all National gear
- Tells all about National's exclusive One Year Guarantee
- Helps you choose the right equipment for your needs



NC®

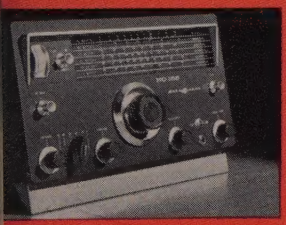
A Wholly Owned Subsidiary of National Company, Inc.

Export: Ad Auriema Inc., 85 Broad St., N. Y. C.

Canada: Tri-Tel Assoc. Ltd., 81 Sheppard Ave. W., Willowdale, Ontario

NATIONAL RADIO COMPANY, INC.

37 Washington Street Melrose, Massachusetts



— The ham-band 80 through r receiver that runs rings *anything* in its price class. 3, CW and AM performance uble conversion, three-step IF selectivity, product de- SB/CW AGC and 1 uv sensi- 99.95

NC-140 — New *double-conversion* general coverage receiver with National's exclusive Dial Selector for calibrated foreign broadcast and amateur bandspread. Q-multiplier, RF stage, and S-Meter. More important features than any receiver in its price class. $189.95

NC-105 — Designed specifically for the beginning amateur. Offers such needed features as general coverage, Q-Multiplier, product detector, S-meter and transformer power supply. Also available in handsome walnut cabinet for use in den or living room as a second receiver. $119.95

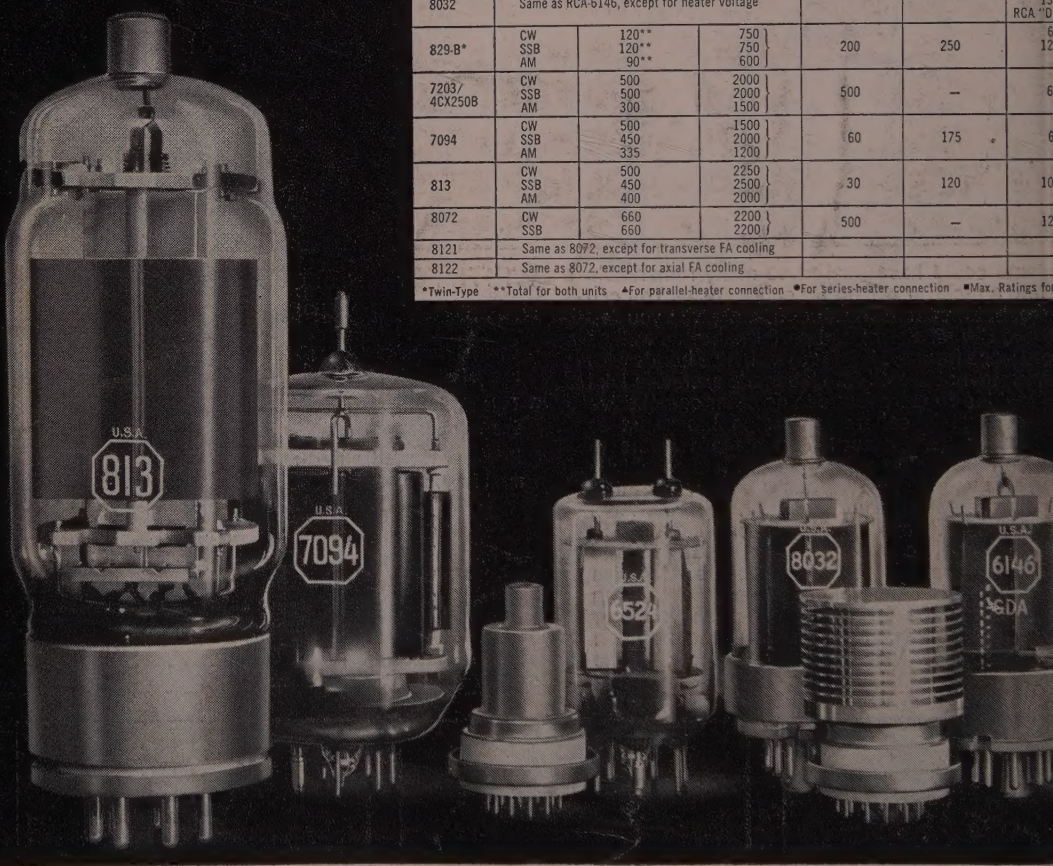
Choice of Amateurs Everywhere

RCA BEAM POWER FOR ALL POWERS

Popular RCA "Beam" Power Tubes for Transmitter Applications (Listed according to power-input ratin

RCA Type	Class of Service	Max. Plate Input Watts▪	Max. DC Plate Volts▪	Max. Freq. for full Input (Mc)	Max. Useful Freq. (Mc)	Hea Fil
8077/7054	CW	9.9	300	40	–	12
5763	CW AM	17 15	350 300	50	–	6
6417	Same as RCA-5763, except for heater voltage					12
7905	CW AM	18 15	300 250	175	–	6 quick
7551	CW AM	24 17.5	300 250	175	–	12
7558	Same as RCA-7551, except for heater voltage					6
2E26	CW SSB AM	40 37.5 27	600 500 500	125	175	6
2E24	Same as RCA-2E26, but has quick heating filament					6
6893	Same as RCA-2E26, except for heater voltage					12
832-A*	CW AM	50** 36**	750 600	200	250	6 12
807	CW SSB AM	75 90 60	750 750 600	60	125	6
6524*	CW SSB AM	85** 85** 55**	600 600 500	100	470	6
6850*	Same as RCA-6524, except for heater voltage					12
4604	CW	90	750	60	175	6 quick
6146	CW SSB AM	90 85 67.5	750 750 600	60	175	6
6883	Same as RCA-6146, except for heater voltage					12
8032	Same as RCA-6146, except for heater voltage					13 RCA "D
829-B*	CW SSB AM	120** 120** 90**	750 750 600	200	250	6 12
7203/4CX250B	CW SSB AM	500 500 300	2000 2000 1500	500	–	6
7094	CW SSB AM	500 450 335	1500 2000 1200	60	175	6
813	CW SSB AM	500 450 400	2250 2500 2000	30	120	10
8072	CW SSB	660 660	2200 2200	500	–	12
8121	Same as 8072, except for transverse FA cooling					
8122	Same as 8072, except for axial FA cooling					

*Twin-Type **Total for both units ▲For parallel-heater connection ●For series-heater connection ▪Max. Ratings fo



Whether you're on SSB, AM, or CW—QRP or QRO—there's an RCA Beam Power Tube for every amateur transmitter power level, and for frequencies to 450 Mc and beyond.

Want to build practical compactness into your rig? Choose RCA Beam Power Tubes. They do the job with fewer stages, less expensive components, fewer controls. You can always count on RCA Beam Power Tubes to deliver the power with relatively low plate voltages. Thousands of transmitters in use prove out these facts.

For more useable "transmitter watts," go w Beam Power Tubes. For fast service on the see your RCA Industrial Tube Distributor. F nical data on any of these types write: Cor Engineering, Section B-15-M, RCA Electr Division, Harrison, N. J.

The Most Trusted Nar in Electronics